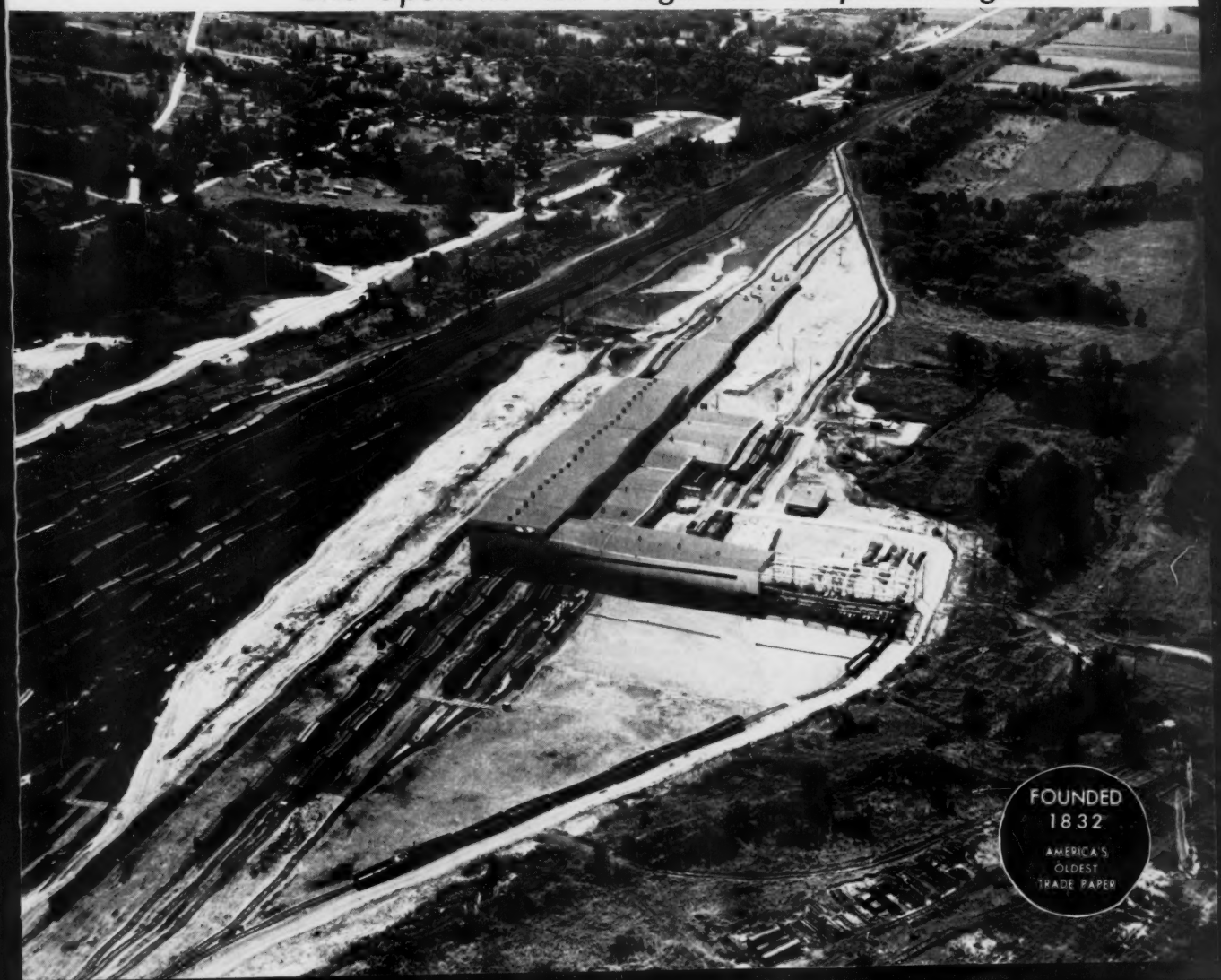
RAILWAY LOCOMOTIVES AND CARS

A SIMMONS-BOARDMAN **TIME-SAVER** PUBLICATION

FEBRUARY 1959



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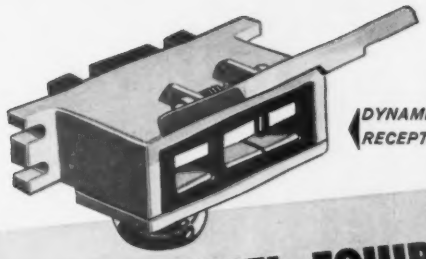

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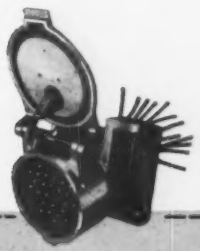
CONTROL RECEPTACLES



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RAILWAY
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MOTIVES
AND
CARS

The Oldest Trade Paper
In the United States

FEBRUARY 1959—VOL. 133 NO. 2

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C. L. Combes
Editor, New York

F. N. Houser
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Norman E. Gillespie
Western Editor, Chicago

A. G. Oehler
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•

Robert G. Lewis
Publisher, New York

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BRANCH OFFICES: 79 West Monroe st., Chicago 3; 1081 National Press Bldg., Washington 4, D. C.; 1501 Euclid ave., Cleveland 15; Suite 203, Carlton House, Pittsburgh 19; 214 Terminal Sales Bldg., Portland 5, Ore.; 244 California st., San Francisco 4; 1151 West Sixth st., Los Angeles 17; 3908 Lemmon ave., Dallas 19, Tex.

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REPORT FOR FEBRUARY

ASME-AIEE Conference

The American Society of Mechanical Engineers, Railroad Division, and the American Institute of Electrical Engineers, Land Transportation Committee, will hold a joint Conference at the Hotel Sheraton, Chicago, April 8 and 9.

AIEE Winter General Meeting

The Hotel Statler will be the headquarters for the winter general meeting of the American Institute of Electrical Engineers to be held at New York February 1-6. Among the subjects to be discussed at sessions of the Land Transportation Committee are the following:

Thursday, February 5
9 a.m.
Insulation Practices

New Insulation Developments for Traction Motor and Generator Field Coils, Wm. Schneider and J. R. Shirley, Westinghouse Electric Corp.

Glass Polyester Banding of Traction Motor Armatures, Wm. Schneider and W. H. Eunson, Westinghouse Electric Corp.

A New Void Free Class H Insulation System for Rotating Machine Windings, G. L. Moses, Westinghouse Electric Corp.

2 p.m.

Improved D-C High Potential Testing of Insulation Systems in Low and Medium Voltage D-C Equipment, A. M. Odok and T. M. Soelaiman, General Electric Co.

A Novel Generating System for Railroad Cabooses, L. B. Haddad, R. A. Vercella, and D. W. Brown, Safety Industries.

Friday, February 6
2 p. m.

A Full-Range Two-In-One (Diesel-Electric, Third-Rail) Locomotive, B. F. Hefner, General Motors Corp.

Prototype Alternating-Current Multiple-Unit Train of the Pennsylvania, K. H. Gordon, Pennsylvania; V. F. Dowden, Budd Co.; E. W. Ames, Westinghouse Electric Corp.

Control for an 8,500-hp Gas Turbine-Electric Locomotive, R. M. Smith and W. B. Zelina, General Electric Co.

Railroads Continue Shop Modernizations

The steam locomotive shops of the Grand Trunk Western at Battle Creek, Mich., are to be converted to a diesel facility at an estimated cost of $1,200,000. The project will provide heavy repair shop for diesels and facilities for terminal diesel servicing and repairs.

To centralize facilities for the storing of car-repair materials, various locomotive and car-equipment maintenance operations have been relocated at the Waterville, Me., shops of the Maine Central. Passenger-car repair facilities have been moved to a section of the paint shop, together with tin and pipe shops, and freight-car repair facilities now occupy area previously used for passenger-car work. In both areas ma-

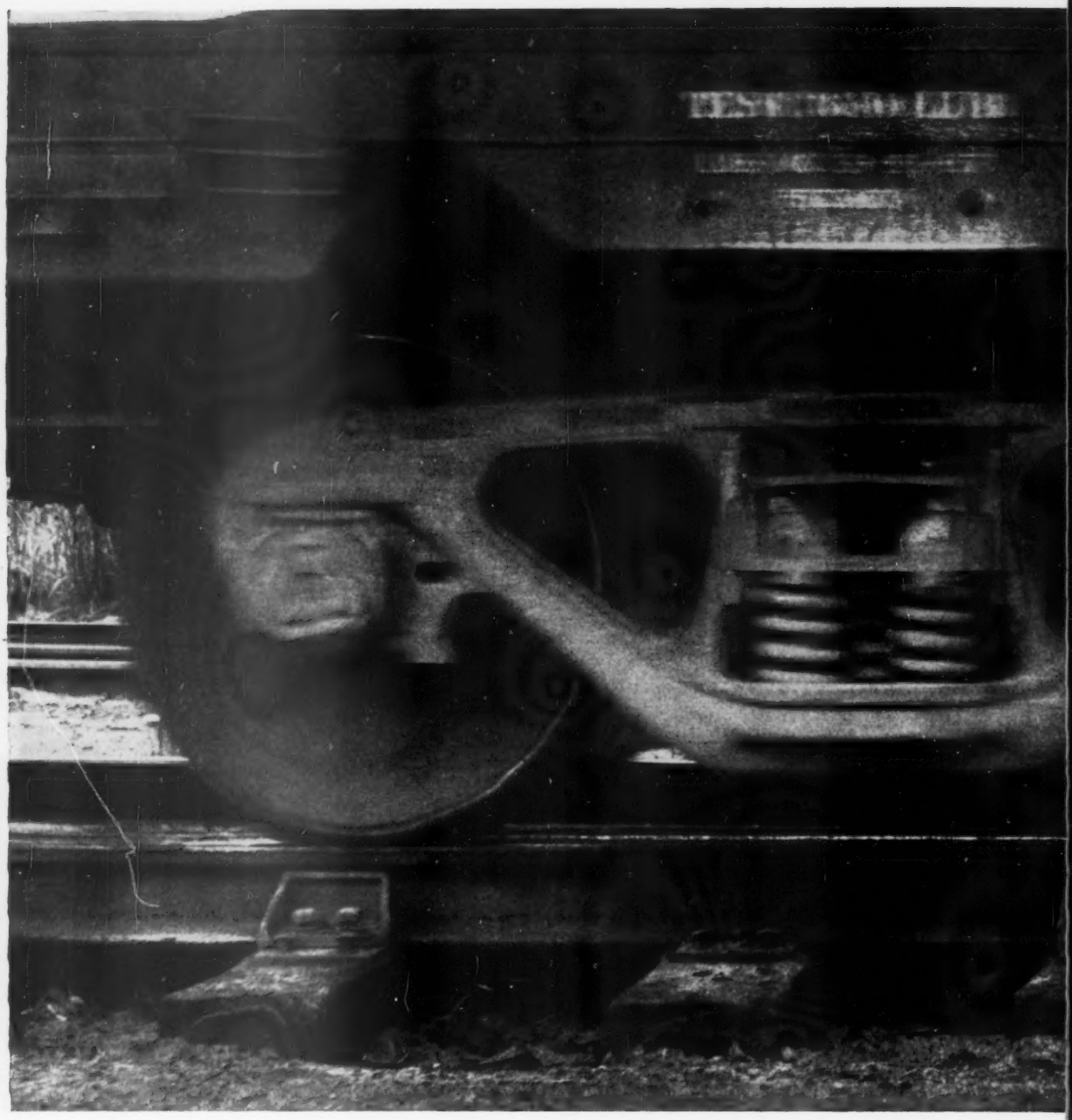
(Continued on page 9)

TIME SAVING IDEAS FOR FEBRUARY

MOTIVE POWER AND CAR

ELECTRICAL

DEPARTMENTS



Where payloads roll on roller bearings . . . Gulf makes things run better!

NEW GULFCROWN R.R.

New Gulfcrown R.R. is a lithium base grease especially developed to provide better lubrication for railroad car roller bearing journals. It has been tested and approved against A.A.R. Specification No. M-917-56.

Stands up at high temperatures. New Gulfcrown R.R. has been used successfully in bearings operating at temperatures as high as 250° F.

Pumps freely at low temperatures. Gulfcrown R.R. Grease doesn't become hard, or unworkable, even when subjected to temperatures as low as 0° F.

Won't thin out at high speeds. Its excellent mechanical stability keeps Gulfcrown R.R. from thinning out under the churning action of high speed bearings.

Resists washing action of water. Won't wash away even under wettest conditions. Gulfcrown R. R. also provides protection against rust.

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Excellent oxidation stability. New Gulfcrown R. R. Grease is effectively inhibited against oxidation to insure long life, both in storage and in use.

Gulfcrown R.R. Grease is available now, in 35 lb. pails, 100 lb. drums and 400 lb. drums. Let us prove that you will get more effective roller bearing protection—and reduced maintenance costs—with this outstanding new grease. Write or phone.

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Pittsburgh 30, Pa.

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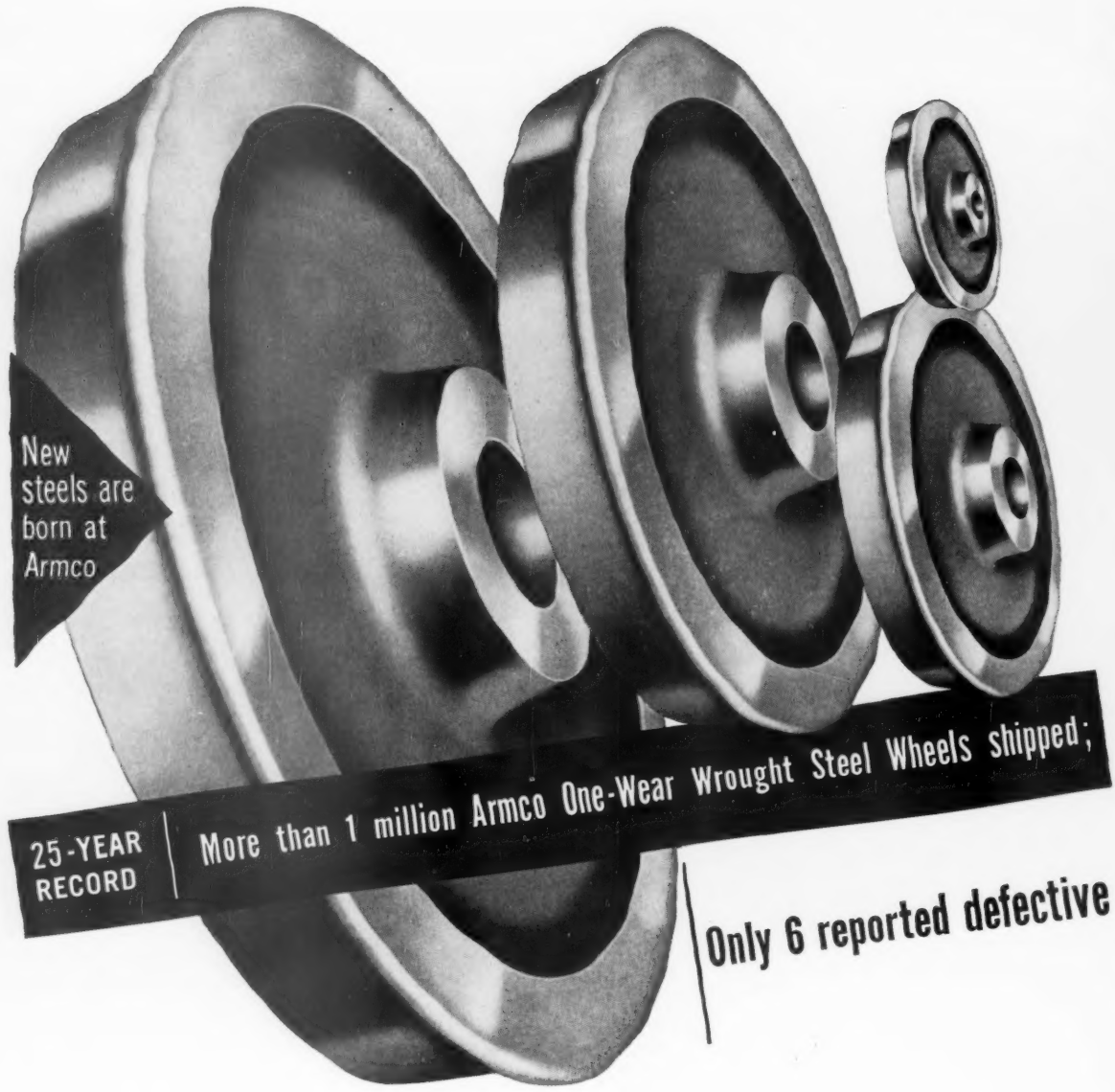

From 1932 through 1957, Armco produced and shipped more than 1,000,000 one-wear wrought steel wheels. Of this number, only six—*less than six ten-thousandths of one per cent*—were reported as defective.

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Dependable service is literally worked into Armco One-Wear Wrought Steel Wheels by *forging and rolling*. Wear resistance and toughness are imparted to every inch of the wheel in these operations. That's why they can't be beat for miles of trouble-free service.

For complete information about dependable Armco Wrought Steel Wheels just call our nearest sales office or write Armco Steel Corporation, 1069 Curtis Street, Middletown, Ohio.

ARMCO STEEL

Armco Division • Sheffield Division • The National Supply Company • Armco Drainage & Metal Products, Inc. • The Armco International Corporation • Union Wire Rope Corporation • Southwest Steel Products

King-sized 20,000-gal tank car was recently completed by Shippers Car Line division of ACF. Union Tank has also placed similar cars in service. Trend to larger tank cars is expected to be accelerated by incentive rates for volume movements. Railroads and owners benefit from reduced servicing and handling when fewer units move traffic.

TABLE OF CONTENTS

While of some interest to all concerned, the rules as shown are of primary interest to personnel in groups as indicated in following table:

GROUP — I — SHOP AND REPAIR TRACK FORCES
GROUP — II — BILLING OFFICE FORCES
GROUP — III — TRANSPORTATION YARD FORCES

RULE	SUBJECT	INTERESTED GROUPS I	II	III
Preface	General Instructions.	X	X	X
1.	Care of freight cars and extent of repairs thereto.	X		X
2.	Conditions governing delivery and acceptance of cars in interchange.	X		X
3.	Requirements of freight cars acceptable in interchange.	X		X
4.	Use of defect, billing repair and joint evidence cards.	X	X	X
5.	Use of defect cards for damage and wrong repairs and billing on such authority.	X	X	X
6.	Recording and filing of repair cards and billing therefor.	X	X	X

Revision of AAR interchange rules should be completed during 1959. The new 1959 rule book shows evidences of the progress of this revision. Table, included for first time, specifies individual rules which are of particular interest to each of three groups—shop and repair track forces, billing office forces, and transportation yard forces.

Shop Modernizations

(*Continued from page 5*)

chines and machine tools have been relocated and lighting improved.

Direct savings and indirect savings in time consumed for obtaining material are expected to result from this relocation. Materials for the locomotive and wheel shops are also available from the same storeroom.

The New York, New Haven & Hartford is seeking approval of a $1,500,000 government loan in order to centralize shop facilities at New Haven.

Personal Mention

Bessemer & Lake Erie.—*Greenville, Pa.*: Title of S. O. RENTSCHLER, superintendent motive power, changed to chief mechanical officer. Title of D. L. STANLEY, assistant superintendent motive power, changed to superintendent, locomotive department.

Canadian Pacific.—*Vancouver, B.C.*: A. THOMAS, general locomotive foreman, retired. *Moose Jaw, Sask.*: H. A. PIPER appointed general locomotive foreman, succeeding JOHN BENNETT, retired.

Chicago, Milwaukee, St. Paul & Pacific.—*Mitchell, S. D.*: W. B. GAGE appointed assistant master mechanic, Iowa, Minnesota & Dakota Division. *St. Paul, Minn.*: E. F. HATZENBUHLER appointed master mechanic, Hastings & Dakota, Twin City Terminal, Duluth Divisions, La Crosse & River second and third districts, and La Crosse, Wis., succeeding Mr. Gage.

New York, Chicago & St. Louis.—*Brewster, Ohio*: JOHN E. KLOSS appointed master mechanic, Wheeling & Lake Erie district, succeeding J. O. HILL, retired. Mr. Kloss formerly assistant to chief mechanical officer at Cleveland. A. C. ROBINSON, general diesel foreman, named assistant master mechanic, W&LE district, R. J. SNY-

(*Continued on page 12*)

Orders and Inquiries for New Equipment

Placed Since the Closing of the January Issue

Diesel-Electric Locomotives

Road and builder	*No. of units*	*Horsepower*	*Service*	*Other detail*
BATH & HAMMONDSPORT: Plymouth Locomotive Works	1	200	Switcher	25 ton. For delivery this month.
CHICAGO & NORTH WESTERN: Electro-Motive	16	1,750	Road switch.	GP-9's. For delivery by March 31.
DULUTH, MISSABE & IRON RANGE: Electro-Motive	16	1,750	—	SD-9's.
Alco Products	6	2,400	Switchers.	DL 600B's.

Freight Car Orders

Road and builder	*No. of cars*	*Type of car*	*Cap., tons*	*Length, ft-in.*	*Other detail*
CANADIAN NATIONAL: Canadian Car	12	Hoppers	40	—	In addition to 40 reported in Nov. Delivery to begin this month.
CHICAGO, MILWAUKEE, ST. PAUL & PACIFIC: Pullman-Standard	300	Box	50	40-0	100 equipped with roller bearings.
	100	Insulated box	70	50-0	
General American	300	Box	50	40-0	With roller bearings.
CHICAGO, ROCK ISLAND & PACIFIC: American Car & Fdry.	500	Box	50	40-6	100 to have DF loaders.
		Insulated box	50	50-1	With DF loaders. Delivery of 600 cars scheduled for March.
General American	100				
DELAWARE & HUDSON: International Rwy. Car. Div.	10	Caboose	—	—	Cost, approx. $25,000 each. To have electric lights, automatic refrigeration, running water, etc.
DENVER & RIO GRANDE WESTERN: Company shops	10	Caboose	—	—	—
FRUIT GROWERS EXPRESS: Company shops	200	Insulated bunkerless reefers	70	50-0	RBNX type, with Evans DF loading devices.
	100	Insulated bunkerless reefers	50	40-0	RBNX type, with Evans Quick-Loading devices. Production of 300 cars to begin in March.
LEHIGH VALLEY: Company shops	75	Flat	22½	40-1	All steel.
	50	Flat	25	52-1	All steel.
MINNEAPOLIS, ST. PAUL & SAULT STE MARIE: Company shops	100	Box	—	—	—
	50	Gondola	—	—	—
	25	Flat	—	—	—
	25	Covered hopper	—	—	—
NEW ORLEANS PUBLIC BELT: Thrall Car Mfg.	100	Covered hopper	70	—	—
UNION PACIFIC: American Car & Fdry.	50	Piggyback flat	—	85-0	These cars (100) in addition to those reported in Nov. For 1st quarter delivery.
Pullman-Standard	50	Piggyback flat	—	85-0	
UNION TANK CAR CO.: Company shops	57	Tank	—	—	Class 105. In addition to 42 reported in Dec.

(*Continued on page 12*)

With Baldwin conversion kits, you can modernize your VO engines at low cost

Modernized Baldwin VO locomotives are now operating on the Southern Pacific and on many other lines.

Maintenance and operating costs of your Baldwin VO units can be substantially reduced and their performance so improved that they will match that of the 600 Series engine. This is made possible by the application of new design parts now available in modernization kits for both 6- and 8-cylinder engines. These parts can be applied in your own shops.

Among many other advantages of modernizing your VO locomotive engine the Baldwin way are (1) fuel savings of more than 15%; and (2) substantial savings in cylinder head replacement.

The Baldwin conversion kits are the product of long and extensive research, and before their introduction they were subjected to field tests of the most exhaustive nature. For detailed information on a program that can save your road many thousands of dollars, write for a copy of our new Bulletin 2010.

Major features of conversion this Baldwin way

- New cylinder head with central injection can be directly applied to existing Model VO "A" frame; original bolting arrangement is retained
- Cylinder head is machined to accommodate the same valve gear and the same intake and exhaust valves used on Model 600 engines
- Pistons are identical with those on Model 600 engine
- A 1-piece, lightweight cylinder head cover is provided; also CC size fuel injection pumps designed to retain the original camshaft; fuel injectors with top inlet connection
- Larger fuel pump and pushrod rollers are provided

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Hydraulic turbines • Weldments • Dump cars • Nonferrous castings • Special machinery • Bending rolls • Machine tools

NATIONAL TRADE-MARK has the team to assist you in proper brush selection

KEN MATZ

A railroad had both mechanical and electrical problems causing excessive maintenance on diesel traction motors, says "National" Carbon Technical Serviceman, Ken Matz.

The trouble was attributed to brushes. Ken assisted the railroad in analyzing the problems. After evaluating various brush grades, his recommendation for a change to a "National" brush grade was promptly adopted by the railroad.

Subsequent inspections by Ken, Floyd Anderson and John Gibb substantiated his recommendation. Once again, this demonstrates the thoroughness with which your "National" Carbon Brush Men handle railroad brush problems. There are twenty-six of these specialists throughout the country ready to serve you. For information call or write: National Carbon Company, Division of Union Carbide Corporation, 30 East 42nd Street, New York 17, New York.

Passenger-Car Orders—(Continued from page 9)

Road and builder	No. of cars	Type of car	Other detail
SPOKANE, PORTLAND & SEATTLE:			
St. Louis Car	1	RPO baggage	Cost, $135.000. For delivery in November.

Notes and Inquiries

FREIGHT CARS:

Chicago & North Western will upgrade nearly 8,000 freight cars in company shops during 1959 at a cost of $9,000,000. Shop to be operated at full capacity with production averaging 31 cars daily.

Chicago, Milwaukee, St. Paul & Pacific will purchase, in addition to cars listed above, 50 60-ft 70-ton flat cars.

Denver & Rio Grande Western will spend approximately $3,300,000 for new equipment in 1959, including 100 insulated DF box cars; 25 70-ton covered hopper cars; 100 50-ton flat cars, and 15 85-ft piggyback flat cars.

Louisville & Nashville has authorized installation of DF equipment in 200 40-ft box cars.

PASSENGER CARS:

Long Island is purchasing 30 air-conditioned lightweight coaches from Boston & Maine.

Elmer Lehmkuhl
Arcair Co.

William R. Mogg
Crucible Steel

Personal Mention

(Continued from page 9)

DER, assistant master mechanic, appointed district superintendent, car department. R. P. RUOF, diesel maintenance foreman, named general diesel foreman.

Pennsylvania.—*Cleveland*: WILLIAM L. THIGPEN appointed master mechanic, succeeding WILFORD H. LONG, transferred to Columbus, Ohio. Mr. Thigpen formerly master mechanic at Cincinnati. *Canton, Ohio*: JOHN W. JACKSON appointed master mechanic, succeeding J. K. SHERWOOD, transferred to Buffalo, N. Y. Mr. Jackson formerly assistant master mechanic at Harrisburg, Pa.

Seaboard Air Line.—*Hamlet, N. C.*: D. M. WOOD appointed general master mechanic, with jurisdiction over Virginia, Georgia and Carolina divisions. Offices of master mechanic at Raleigh, Howells, Ga., and Savannah abolished.

Southern.—*Selma, Ala.*: THOMAS P. SCOTT appointed road foreman of engines. *Valdosta, Ga.*: CLINTON J. MCMICHEN appointed general foreman. Formerly general foreman at Macon, Ga. *Macon, Ga.*: JOHN H. W. MILLER appointed swing general foreman. *Rock Hill, S. C.*: ROSCOE L. LEMLY appointed general foreman, succeeding Mr. Miller. *Columbia, S. C.*: JAMES C. POPE appointed general foreman car repairs. EVERETT F. KIRSCHNER appointed general foreman, succeeding Mr. Pope. Mr. Kirschner formerly foreman electricians at Spartanburg, S. C.

Obituary

Truman J. Lyon, 62, master mechanic, Indiana Harbor Belt, died January 2 in Ingalls Memorial Hospital, Harvey, Ill.

Supply Trade Notes

UNI-PAK CORPORATION; SUPERIOR DIESEL FILTER COMPANY.—*W. Hunter Russell* appointed vice-president of Uni-Pak and Superior, with headquarters at Chicago.

■

YOUNGSTOWN STEEL CAR CORPORATION.—*Andrew M. Mitchell* appointed director of engineering and manufacturing. Formerly superintendent of Taylor Forge & Pipe Company.

■

PITTSBURGH PLATE GLASS COMPANY.—*Dr. Howard L. Gerhart*, research director, appointed director of research and development, Paint and Brush Division.

■

CENTRAL EQUIPMENT COMPANY. A new railway and industrial supply company formed by *E. K. Goldschmidt, K. T. Benninger,* and *G. C. Beck,* formerly with Safety Industries, and H. C. Corbin, formerly with Vapor Heating Corporation. Mr. Goldschmidt elected president of of Central Equipment, which will represent *Safety* Industries in the midwest, *K. W. Battery Company* on certain railroads.

Norman J. Kirk
Toledo Pipe
Threading

C. J. Moore
Electric Storage
Battery

TOLEDO PIPE THREADING MACHINE COMPANY.—*Norman J. Kirk* appointed president and general manager.

■

ELECTRIC STORAGE BATTERY COMPANY, EXIDE INDUSTRIAL DIVISION.—*C. J. Moore* appointed to newly created position of general sales and marketing manager; headquarters, Philadelphia. Formerly sales manager.

■

YOUNGSTOWN STEEL DOOR COMPANY.—*Arthur J. Doyle*, assistant vice-president, elected a vice-president.

■

DEARBORN CHEMICAL COMPANY. *Robert A. Carr,* president and director, elected chairman of Railway Progress Institute.

ARCAIR COMPANY.—*Elmer Lehmkuhl* appointed sales manager, Eastern Division. *Durward B. Vaught* appointed field representative in Virginia, Kentucky, southern West Virginia, and other southern states, as well.

■

CRUCIBLE STEEL COMPANY.—*William R. Mogg* appointed sales manager, Spring Division. Formerly sales manager of special products, Cleveland Graphite Bronze Company.

■

DANA CORPORATION.—*C. C. Dybvig* elected vice-president sales. *W. H. Schomburg* appointed assistant general sales manager.

■

POOR & CO., PEERLESS EQUIPMENT DIVISION.—*Lee P. Thomas* appointed president, succeeding *Norman T. Olsen*, deceased.

■

PULLMAN-STANDARD CAR MANUFACTURING COMPANY. — *Ray M. Shaver,* manager of freight-car engineering, appointed assistant vice-president in charge of freight-car engineering, Michigan City, Ind. *Wilfred Fall,* manager of all passenger-car engineering, appointed assistant vice-president in charge of all railroad passenger car engineering, with headquarters at Worcester, Mass.

■

GULF OIL CORPORATION.—*William Mahler* appointed supervisor, Transportation Market, New York Sales division. Formerly marine sales representative, Philadelphia.

■

MCGRAW-EDISON COMPANY, NATIONAL ELECTRIC COIL DIVISION. — National Electric Coil, in merger, has become National Electric Coil Division of McGraw-Edison Company, with no change in overall management.

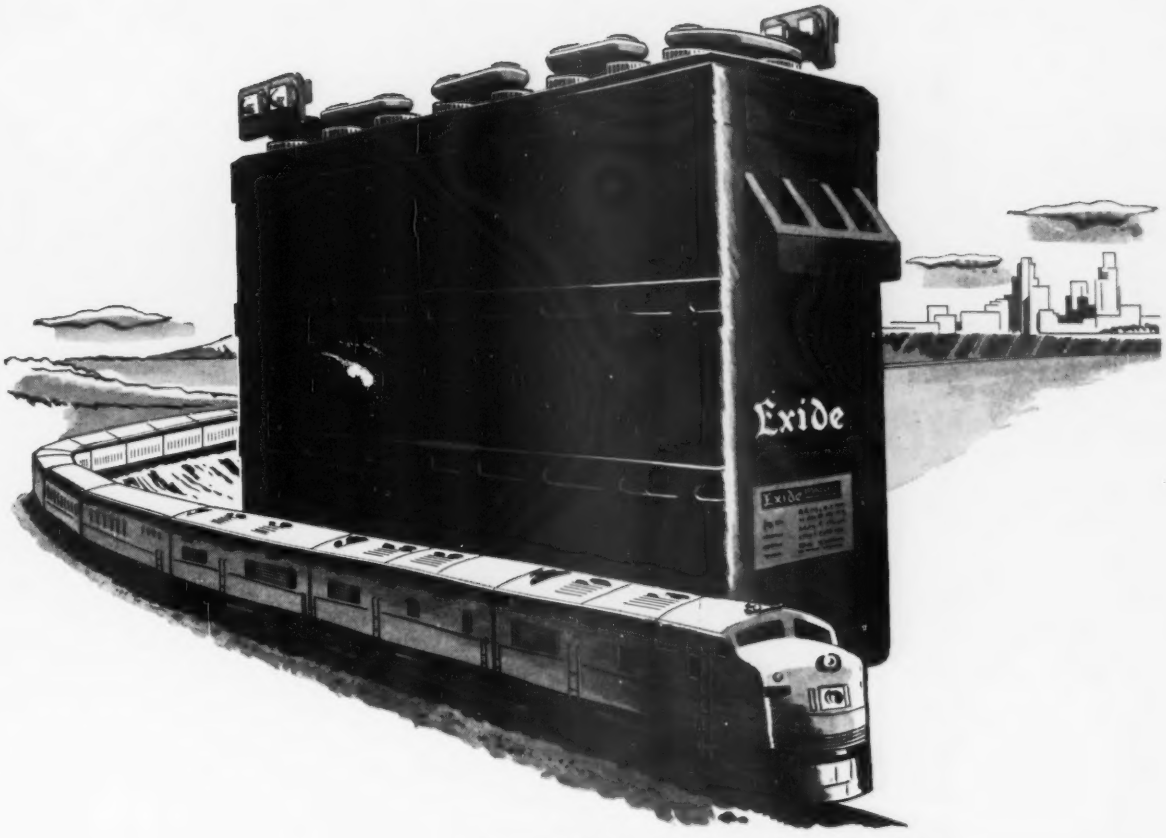
■

WHITING CORPORATION.—*Gilbert H Van Schaik,* sales engineer at Chicago, has assumed duties of manager of Chicago district office, succeeding *R. S. Hammond,* retired. *Harrison Taylor,* assistant district manager at New York, appointed manager of St. Louis district office, succeeding *Frank P. Walsh,* retired. *Robert J. Enroth* and *Bruce Elmblad* appointed to sales staff at Chicago and New York district offices, respectively.

■

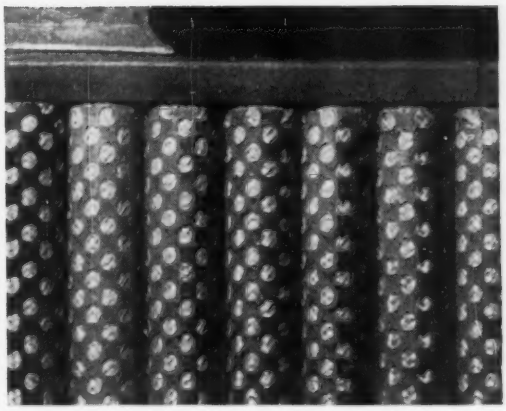
JOHNS-MANVILLE FIBER GLASS INC. —Johns-Manville Fiber Glass, a new and wholly-owned subsidiary of *Johns-Manville Corporation,* has taken over the assets and business of the *L. O. F. Glass Fibers Com-*

(Continued on page 62)



The new Exide-Ironclad diesel locomotive battery

MORE POWER, LONGER LIFE—THIS BATTERY BELONGS IN YOUR ECONOMY PROGRAM



50 YEARS AGO, Exide patented the now-famous Exide-Ironclad tubular positive plate battery. For power and economy, nothing has ever matched it. Yet Exide engineers have constantly improved it. Today's battery (positive plate shown above) packs more power per plate . . . gives you a 50% increase in amperes discharged at diesel cranking rates even over previous model Exide-Ironclad Batteries.

How many things can you buy today that give better performance than their predecessors, yet cost less to own and use? Well, the new Exide-Ironclad diesel locomotive battery is one. You get actually more starting power from the same capacity. And you save money three ways:

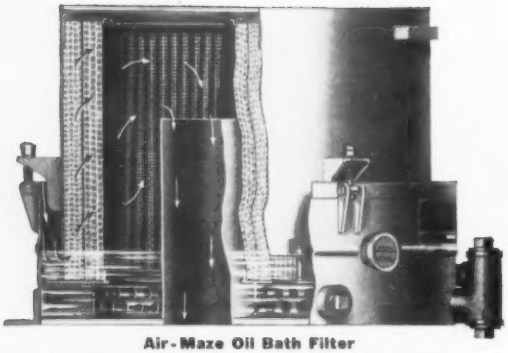
1. **More power per dollar when you buy it.** Because the new Exide-Ironclad makes a more efficient use of battery materials, you get more power in the same space. Cost savings are passed on to you.
2. **Longer life.** The new armored porous tubular construction of the positive plates virtually eliminates loss of active material. So the battery lasts longer—further reducing the cost of your battery power. Superior porosity actually improves battery performance.
3. **Greater versatility.** Because it packs its power in a smaller size, your new Exide-Ironclad Battery provides ample power for large locomotives—yet fits smaller ones. So every battery you have is more useful.

Beyond question, here is today's outstanding value in a diesel locomotive battery. New, portable chargers for every application. **Write for the new, illustrated bulletin. Exide Industrial Division, The Electric Storage Battery Company, Philadelphia 20, Pa.**

Exide®

longer life for your locomotive diesels

with cleaner intake air from AIR-MAZE oil bath or panelbath filters



Air-Maze Oil Bath Filter
for efficient filtration at low maintenance expense.

Air-Maze Panelbath Filter
for effective filtration at low initial cost.

Which should you use? *One or both of these Air-Maze filters has the economic answer to your locomotive requirements. Evaluate the advantage of each filter under your operating conditions.*

OIL BATH FILTER—Removes 92% or more of all objectionable dirt... has exceptionally high dirt-holding capacity... requires only semi-annual or annual oil changes and bowl deposit removal.

PANELBATH FILTER—Built to up-grade panel filtration of intake air, the PANELBATH has low initial cost... replaces 2" and 4" oil-wetted or centrifugal panels on engine air intakes. Requires only periodic servicing at 90-day intervals under normal operating conditions.

Replaces panel filtration with resultant efficiency at least equal to that replaced.

The principle of the oil bath used in both these Air-Maze filters is backed by successful service on over 4000 locomotives.

For further information, contact your locomotive builder or write Air-Maze Corporation, Cleveland 28, Ohio.

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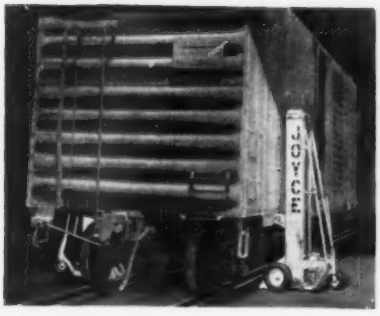
RPI MEMBER

The biggest names in diesels are protected by Air-Maze filters

AIR-MAZE
The Filter Engineers

ENGINE AIR FILTERS • CAR BODY FILTERS • LUBE OIL FILTERS • OIL SEPARATORS • PASSENGER CAR FILTERS



Jacks for Spot System Maintenance Work

The 35-ton capacity jacks, Model 35-AHL, are of solid aluminum alloy construction, have a low center of gravity, and semi-pneumatic tires which simplify positioning of cars on the rip track. They are used in pairs and may be moved inboard and outboard instantly by air cylinders over a simple type of slide, so that finished cars may be moved and the next bad-order car put into place. The low position of the lifting toe is the same height as the car's jacking point, eliminating travel time from a below-surface or track-level location.

A multiple valve arrangement permits synchronization for positive level-lifting.

The height of rise of the jacks is 52½ in. from a starting point of 24 in. Overall height is 101 in.; base width, 31 3/16 in., and weight, 1,620 lb.

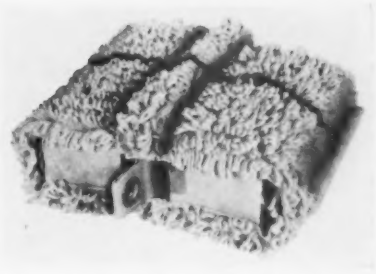
Foolproof shut-off mechanism automatically stops jack at top and bottom of rise, and jack automatically locks under the load in case of air failure. *Joyce-Cridland Company, Dept. RLC, 2027 E. First st., Dayton 3, Ohio.*

Journal Lubricating Pad

A journal lubricating pad, said to feature positive wicking action, dimensional stability and ease of application, is composed of two foam neoprene cores sewn into a tough fabric cover with twisted loop chenille.

According to tests, the pad retains approximately 2,000 grams of oil after saturation, followed by three hours of draining. Positive wicking of oil to the journal is assured by a specially engineered center section that provides a triple path for the oil, while the foam neoprene cores give additional wicking capacity. The oil is distributed evenly over the journal by the twisted loop chenille.

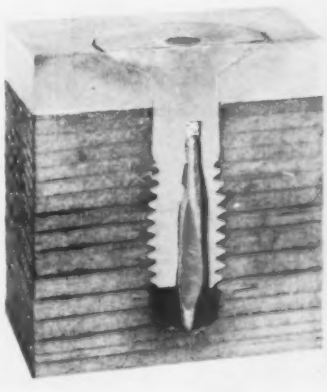
The Absco pad is designed for interchangeability, ease of renovation, and ruggedness, according to Brake Shoe engineers. Materials are preshrunk to maintain accurate size during renovation, and the pad is nylon sewn into a single unit, with

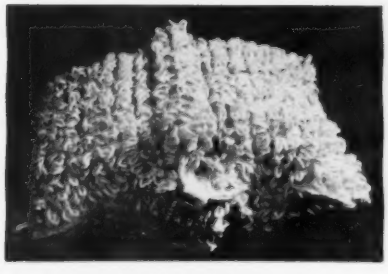


no separate pieces, retainers, or loose metal parts. Retainers are of heavy duty fabric, folded and sewn. Reversible top to bottom and end for end, the pad fits unmodified standard AAR journal boxes and is easily removed by means of a double-thickness pull-out strap. No tools are required for installation. *American Brake Shoe Company, Dept. RLC, 530 Fifth avenue, New York 36.*

Aluminum Paint Stabilizer

An additive, Alcoa Stabilizer No. 5, eliminates the deleafing of aluminum pigments in alkyd and high-acid varnish vehicles and makes possible ready-mixed formulations with acid values up to 28. A few ounces of the clear, amber liquid per gallon of aluminum paint, it is said, increases the durability of the paint and doubles corrosion resistance against salt water and salt-water spray. *Paint Finishes Division, Alcoa Research Laboratories, Dept. RLC, New Kensington, Pa.*





Journal Lubricator

The Wikit journal lubricator has cotton loop pile covering and neoprene foam cores. If features a specially constructed center wick for fast direct wicking; a new fabric construction woven by a patented process which interlocks the loop pile in the weave itself; ABSORBenized R treated jackets for greater absorbency and faster wicking, and a specially shaped jacket. The latter is designed to lubricate the full journal, including end collar and fillet, without exposing the main body of lubricator to damage by them.

The lubricator is designed to insure continous contact with all journals, new and worn, and under all operating and weather conditions. The lubricator acts as its own oil reservoir, holding sufficient oil to provide efficient lubrication for long periods when little or no oil is in the box. It can be applied either side up, either end first, and installed or removed with journal in operating position.

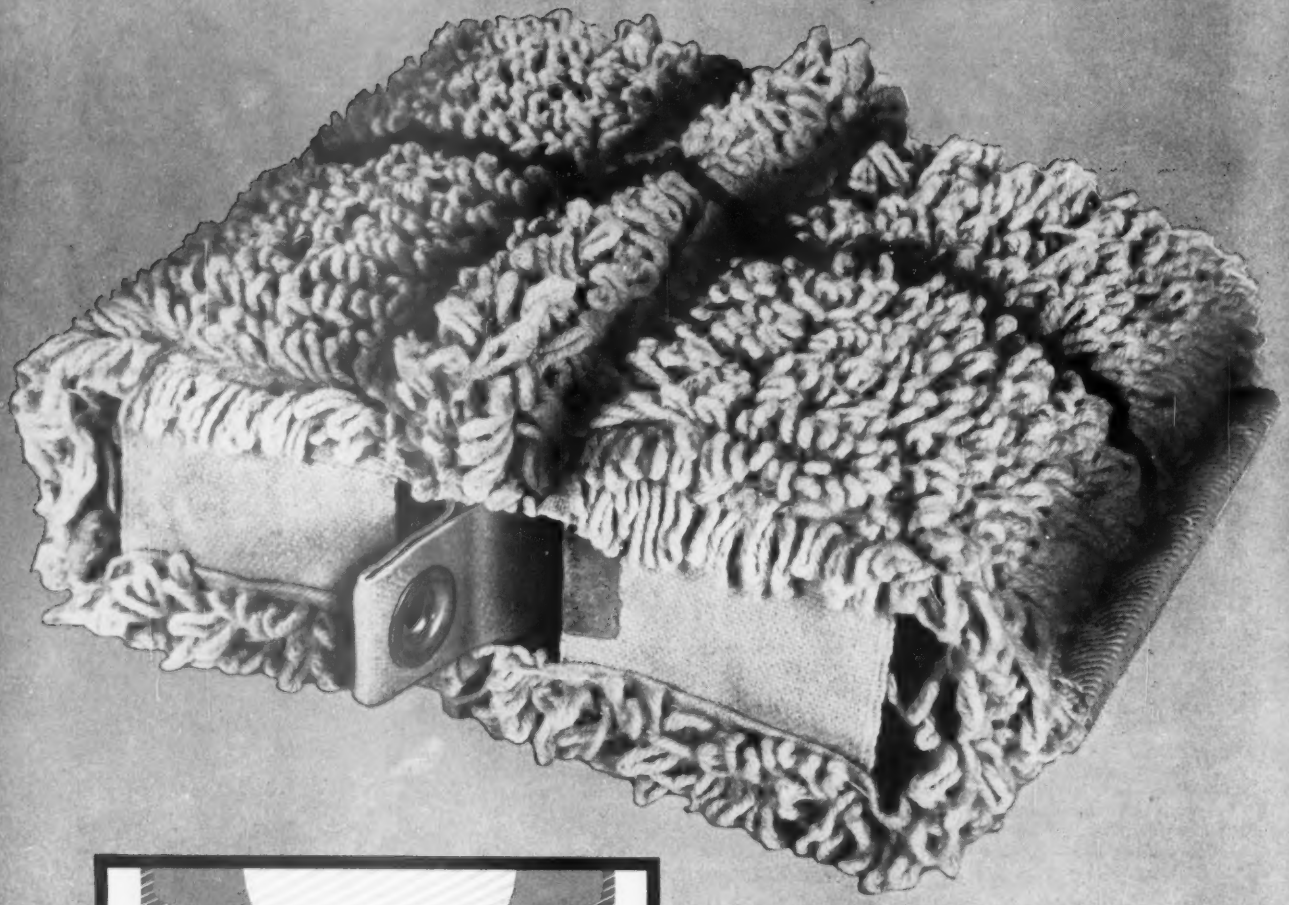
Wikit has been AAR approved for test application in interchange service. *Callaway Mills, Inc., Dept. RLC, 295 Fifth ave., New York 16.*

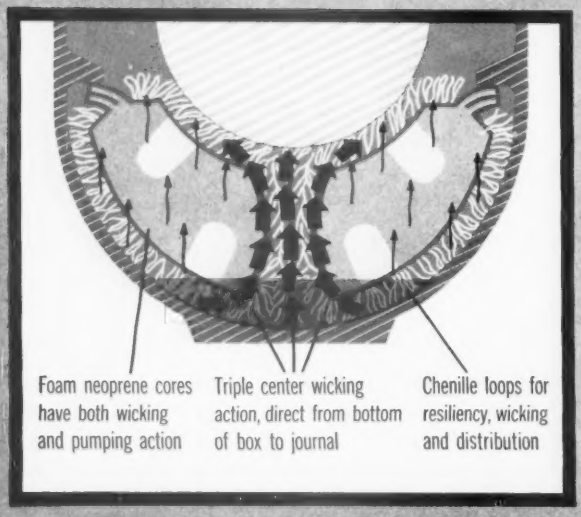
Blind Hole Fastener

The Brush M-W fastener for securing metal floor plates and permanent box-car upgrading panels is said to be particularly advantageous for refrigerator car use because the blind-hole feature eliminates the heat conducted by through bolting. Installation, a one-man operation, is accomplished by drilling a ½-in. hole, ½ in. deep, and dropping in the aluminum-alloy shield. Driving home the expansion pin forces the threads into the wooden member to a diameter greater than the hole diameter and gives gripping power in excess of 1,000 lb. No nut or washer need be affixed and no special tools are required. *Brush Nail Expansion Bolt Co., Dept. RLC, Greenwich, Conn.*

(Turn to page 63)

HERE IT IS:





Triple center wicking action feeds an abundant supply of oil to the journal by the most direct path. More oil flows up through the neoprene cores and still more wicks up through the fabric panels, assuring complete saturation of the chenille cover at all times.

A.A.R. Approved for Limited Interchange Service

American Brake Shoe's new ABSCO lubricating pad... with the best of everything!

The Absco journal lubricating pad is the first and only pad to be engineered and produced with *all* the advantages and characteristics that critical railroad men prefer! Check off this impressive combination of features—combined for the first time in the simple, economical Absco pad:

Dimensional accuracy. All parts precisely cut and assembled. Materials pre-shrunk to maintain accurate size, even after renovation.

Strong pull-out strap. Withstands tremendous pull! Double thickness is triple sewn throughout center section, with a brass grommet through double thickness at each end.

Positive wicking action. Special twisted loop chenilling distributes steady flow of oil over entire journal. Specially engineered center section provides additional path for direct wicking action at shortest distance between free oil and journal. Foam neoprene cores provide further wicking capacity.

Identification. Simple stamped brass tag.

Interchangeability. Absco pads fit standard A.A.R. journal boxes. No modifications necessary.

Ease of application. Easily installed. No tools required. Reversible side to side, top to bottom, end for end.

Stability. Sturdy fabric retainers resist shifting, even at low temperatures.

Resilience. Foam neoprene cores, specially compounded for high resilience with great resistance to set. The compressible chenille loops add to overall resilience.

Ease of renovation. Built to withstand roughest cleaning methods. No delicate or heavy metal parts to break or tear loose.

Long life. Accelerated life tests indicate durability far in excess of the present renovation interval, even under extreme service conditions.

Non-linting. Thoroughly washed and pre-shrunken cotton wicking material was especially selected for its non-linting characteristics.

One piece. No separate pieces or retainers.

Minimum metal. The only metal parts are the two brass grommets and the brass identifying tag.

Oil retention. Our tests show fully soaked pads retain approximately 2,000 grams of oil after 3 hours draining.

Ruggedness. Built to take the toughest treatment—during installation, operation, removal, and renovation. Nylon stitching throughout.

This impressive combination of features and advantages is exclusive with the Absco lubricating pad.

RAILROAD PRODUCTS DIVISION
530 Fifth Avenue, New York 36, New York

AMERICAN Brake Shoe COMPANY

YELLOW STRAND SAFETY SLINGS

custom engineered to your needs

Yellow Strand Braided Safety Sling made of eight parts 7/16" 6x19 Regular Lay. Legs are 10' 7" on one side and 10' 3" long on the other to lift the unbalanced load of 38,000 lbs.

No two lifts are identical. So it will pay you to have your Yellow Strand man analyze your lifting requirements and recommend the Yellow Strand Safety Slings and Wire Rope that will serve you best. We will design and build slings to suit your specific needs. And you can be sure that B & B Slings will be made from the best materials—Yellow Strand!

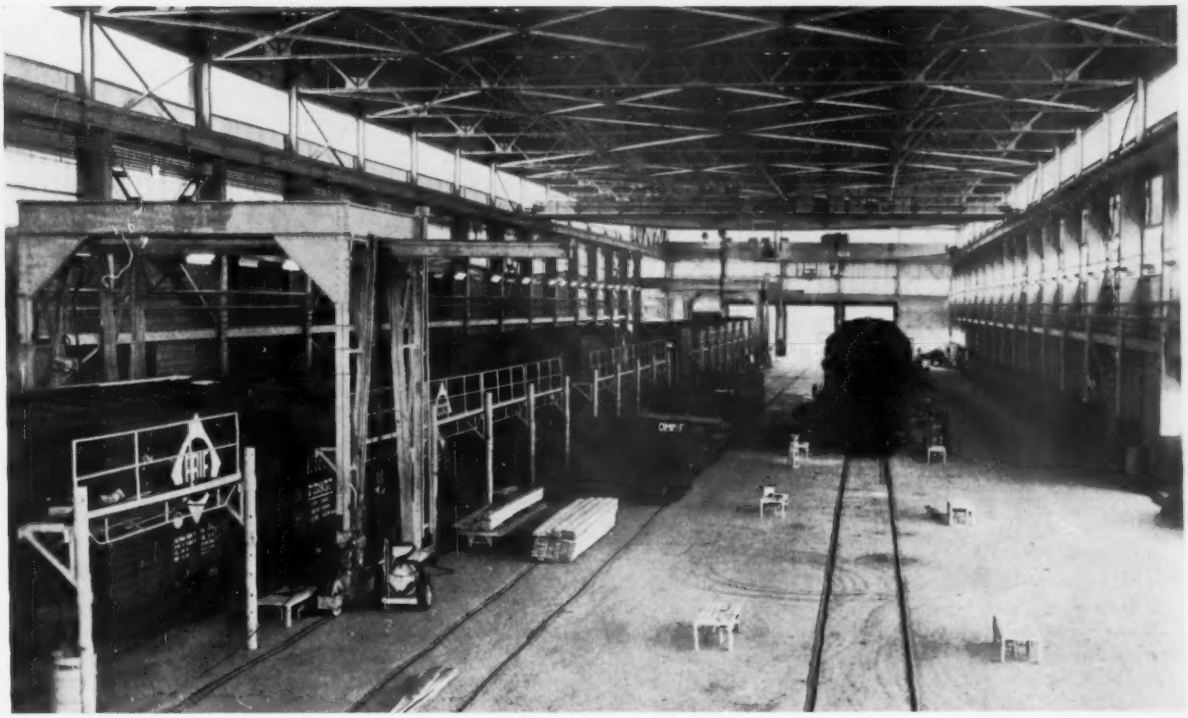
Broderick & Bascom Rope Co., 4203 Union Boulevard, St. Louis 15, Mo.

Yellow Strand®

WIRE ROPE

SLINGS

CLIPS



Main repair shop, with area of 60,000 sq ft, has two production tracks and center track which is used for material cars along the work lines.

Erie Opens New Freight-Car Shop

Modern plant located at mid-point of Erie main line can overhaul 14 cars each day

The $4,000,000 car repair shop recently opened by the Erie at Meadville, Pa., has been designed for the heavy repair of 14 cars each 8-hr day. The Meadville location now puts Erie heavy car repair facilities at almost the mid-point of its New York-Chicago main line. In addition, the road's central wheel shop and the scrap and reclamation plant are also located at Meadville. The presence of these operations, at the same point where heavy car repairs are made, greatly reduces material handling.

Floods resulting from Hurricane Diane in August 1955 severely damaged the Erie's now-abandoned freight-car shop at Dunmore, Pa., near Scranton. This outmoded facility was located on a branch line near the east end of the railroad. The cost of repairs to an obsolete building and the inconvenient location of the Dunmore plant led to the decision to construct the new Meadville shop.

Today, the Erie has a completely modern car repair facility, with 187,296 sq ft under cover, and almost 20,000 ft of track.

The new facility is located beside the Meadville Yard—an important intermediate division and classification point on the Erie main line. This location simplifies the movement of bad-order cars to the shop, provides space for car storage, and means that there are locomotives available for necessary car-shop switching. Within the shop area, itself, is trackage for the storage of 149 cars. Capacities of the actual repair areas are: Stripping, 33 cars; main shop, 18 cars;

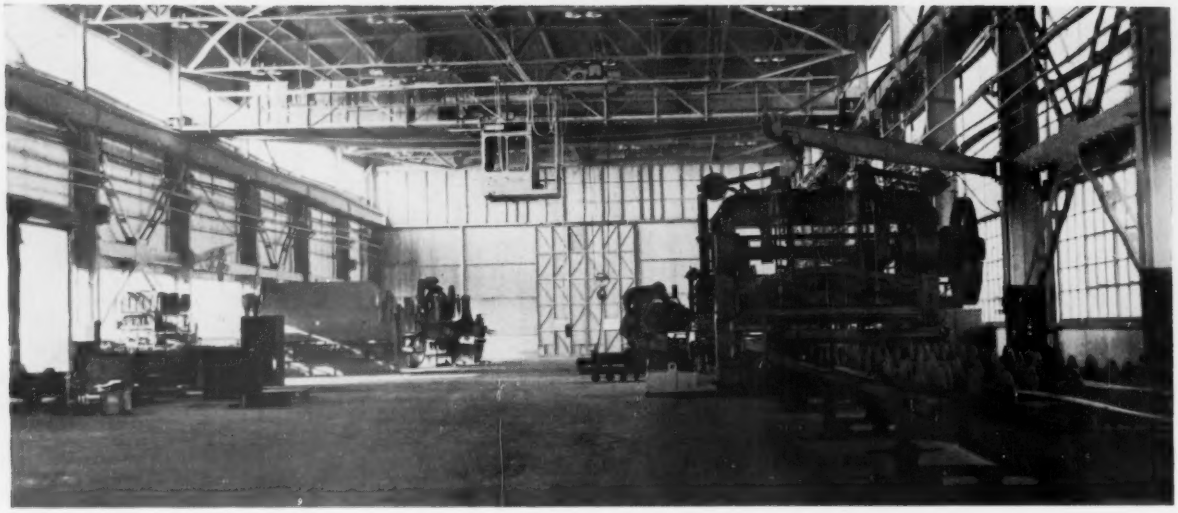


Plate shop has machinery for fabricating almost all freight-car material, including center sills. Area at foreground could be used for setting up subassembly jigs for such parts as sides or roofs.

sandblast and undercoat area, 12 cars; and paint shop, 10 cars. This means that there can be a total of 73 cars undergoing repairs at any one time.

Actually, while this operation is known as a car-repair shop, it has all the space and facilities for the fabrication and assembly of new cars. The main repair and assembly shop is 600 ft long and 100 ft wide. Through it run two repair tracks. A third dead-end material track extends down the center from the stripping area or north end. The bottom chord of the roof truss is 44 ft above the reinforced concrete floor. This shop has two 96-ft bridge cranes, each with a 15-ton main hoist and an auxiliary 5-ton hoist.

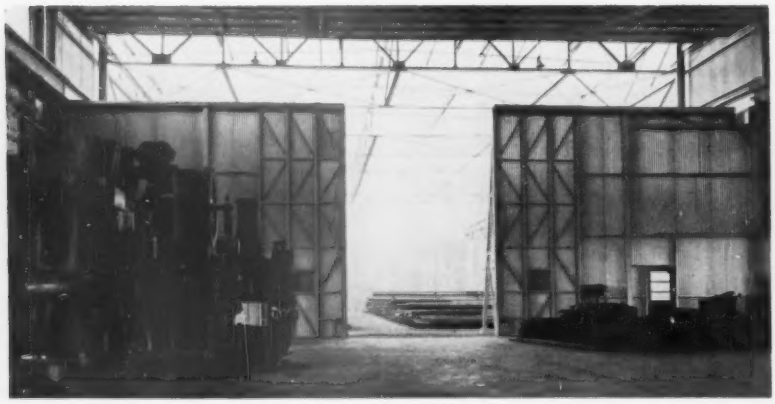
The six-track outside stripping area has adjustable permanent scaffolds and equipment for the straightening of car sides and ends. Wood stripped from cars can be burned adjacent to the stripping operation, and a locomotive crane can handle steel scrap directly into cars for movement to the scrap and reclamation plant, or for shipment to mills.

At right angles to the north end of the 60,000 sq ft main repair and assembly shop is the fabricating shop with 18,750 sq ft of floor area. This shop is equipped with punches, shears, and other metal working tools for the fabrication of car parts. At its west end is an outside steel storage area of 15,000 sq ft. Both the outside storage and the fabricating shop are served by the same 10-ton bridge crane.

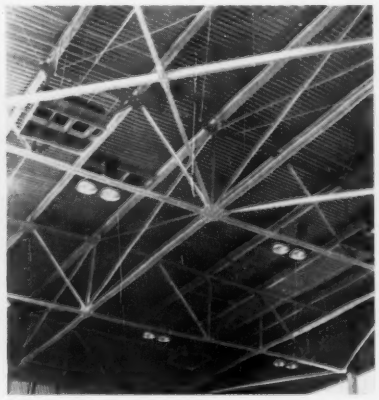
There is sufficient area in this shop to set up both underframe and side jigs for use in conjunction with new car and complete rebuilding programs. The shop is heated by 14 overhead, gas-fired, infra-red heaters. It is lighted with high-bay mercury vapor fixtures.

The main shop is also illuminated with this same mercury vapor lighting. In addition, there are fluorescent side lighting fixtures down both walls for the entire 600-ft. The entire shop structure is sheathed with over 100,000 sq ft of aluminum siding, and natural illumination is provided by 15,500 sq ft of translucent corrugated-plastic panels in the walls of both the main shop and the plate shop just under the bottom roof truss chords.

Along the west wall of the main shop are a series of smaller work areas. The blacksmith shop opens

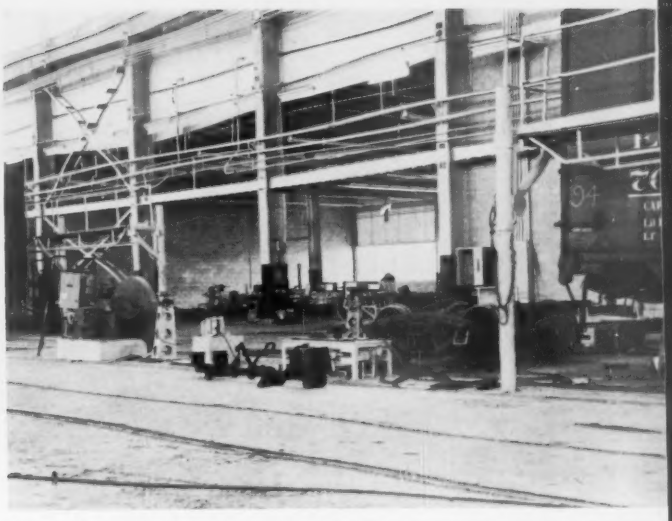


Material—shapes, sheets, and plates—can be moved directly into plate shop with 10-ton overhead crane.



Adjustable-height scaffolds set up along production tracks fit work in progress.

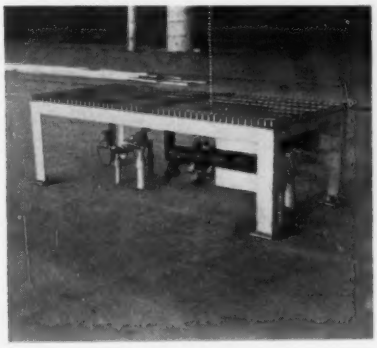
Main repair shop has two 15-ton overhead cranes and two gantries over one of the two repair tracks. Blacksmith shop is at left.



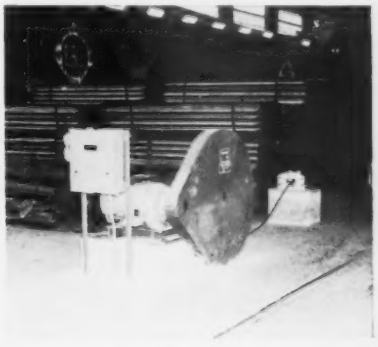
Truck shop opens off repair shop. It has elevated track and powered hoists on gantry for truck work.

directly into the fabricating shop and the main shop. The machine shop has the same 75- x 100-ft dimensions as the blacksmith shop but is a completely enclosed area. It contains the toolroom, pipe shop, and space for the storing of the materials handling trucks used in the repair operations. The next area opens into the main shop and is used for truck repairs. It is also a 75- x 100-ft area and has elevated rails and a gantry crane for truck work. Wheel storage is immediately outside this shop.

Next to the truck repair shop is the 125- x 125-ft lumber storage and wood mill. All lumber can be stored under cover in this area and is placed there directly from cars spotted at the adjacent unloading dock. This area has a complete sprinkler fire protection system. All new woodworking tools were installed in the wood mill. Most of the other major

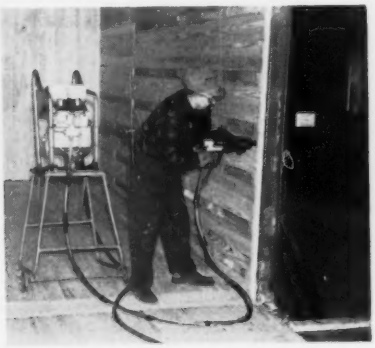


Oxygen, acetylene, air, and electrical receptacles are on each side of track.



Car moving in shop is done with series of Whiting 5-ton car pullers.

Adjustable-height scaffolds set up along production tracks fit work in progress.



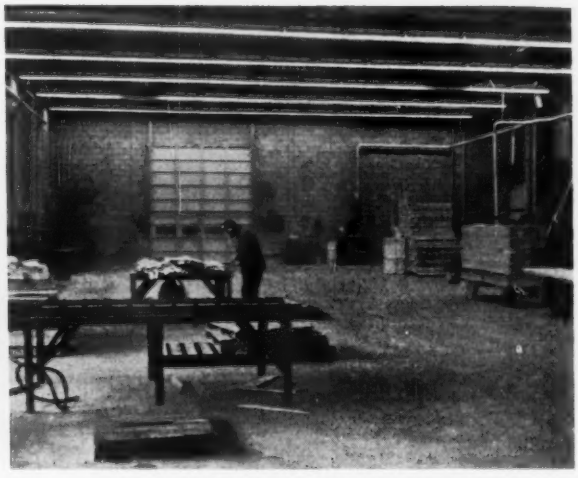
Automatic nailers have been speeding application of lumber in repaired cars.

Movable car-floor-height platform holds automatic nailer while cars are being moved.

Complete blacksmith shop at corner of right angle formed by main shop and plate shop opens directly into both of these areas.

Pipe shop, toolroom and garage for shop trucks are combined in single wing opening off the main repair shop.

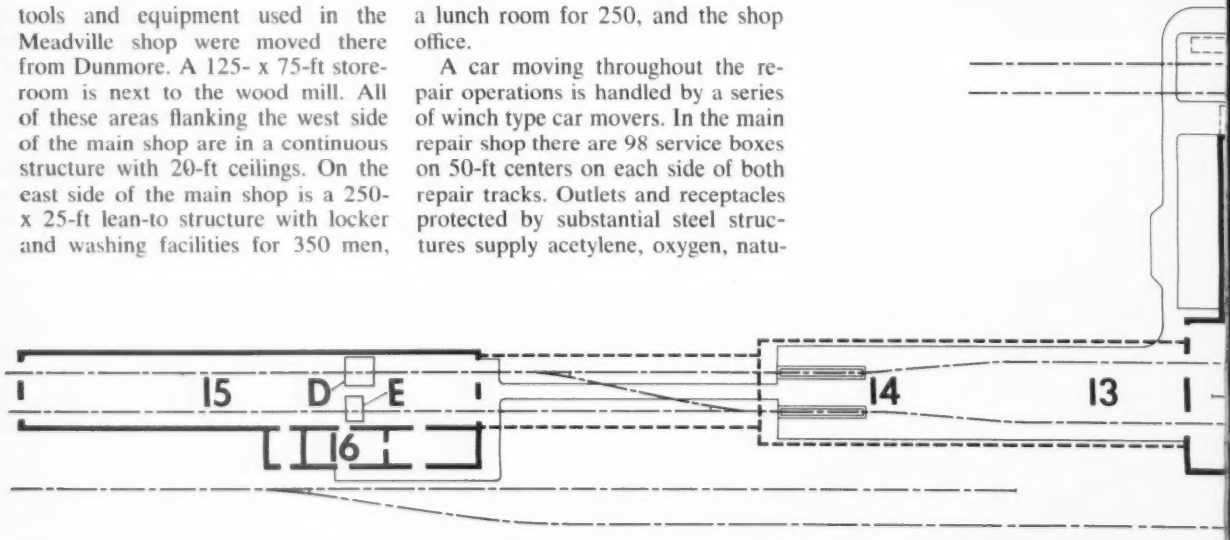
Wheel storage is immediately outside truck shop. Storeroom and material stocks are also located along the main building. Same sidings serve all three areas.



Lumber storage and mill has area of 15,625 sq ft. Erie intends to store all lumber under cover in this shop. New woodworking tools were purchased.

tools and equipment used in the Meadville shop were moved there from Dunmore. A 125- x 75-ft storeroom is next to the wood mill. All of these areas flanking the west side of the main shop are in a continuous structure with 20-ft ceilings. On the east side of the main shop is a 250- x 25-ft lean-to structure with locker and washing facilities for 350 men, a lunch room for 250, and the shop office.

A car moving throughout the repair operations is handled by a series of winch type car movers. In the main repair shop there are 98 service boxes on 50-ft centers on each side of both repair tracks. Outlets and receptacles protected by substantial steel structures supply acetylene, oxygen, natu-



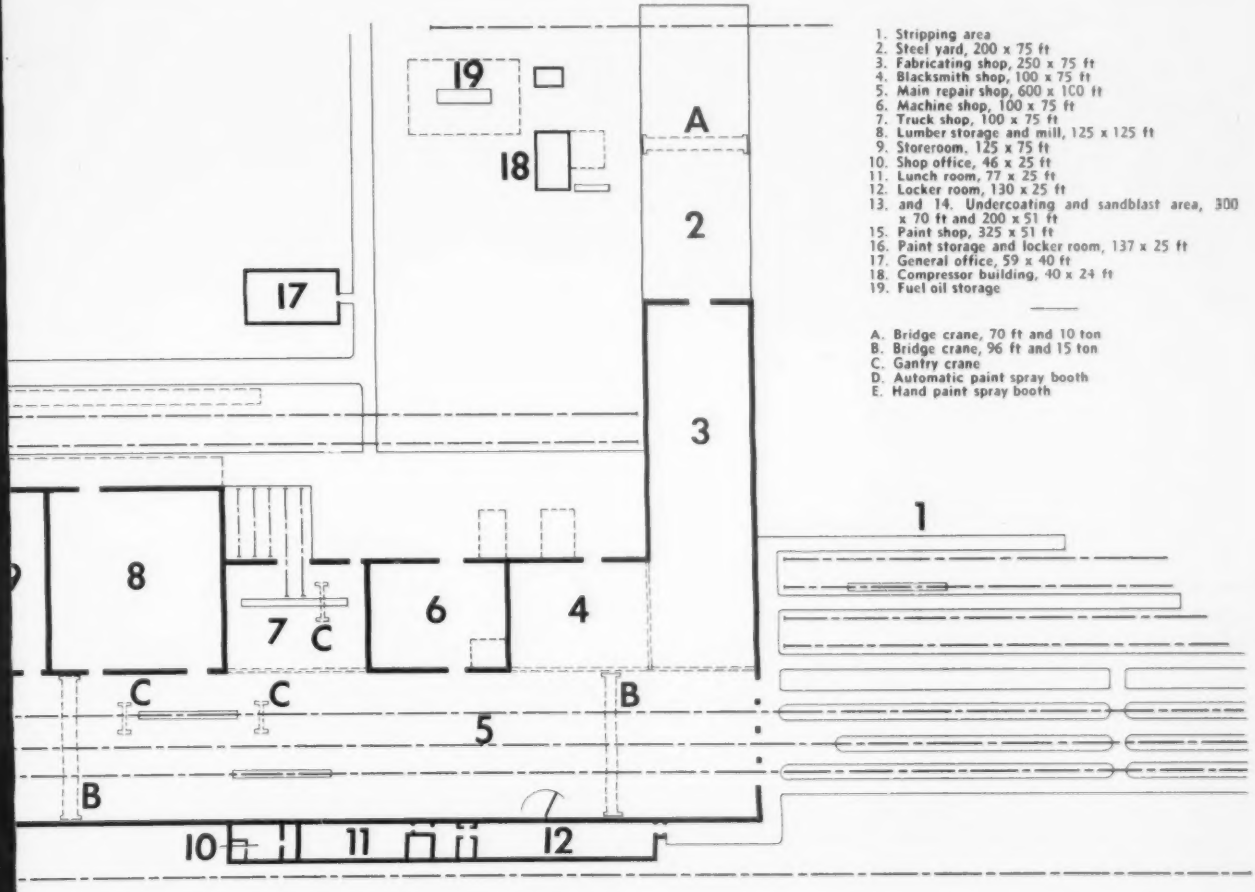
Cars are sandblasted and undercoated in open-sided shelter which connects repair shop with the paint shop.

Pits just ahead of paint-shop doors simplify application of undercoating to the underframes of cars.

ral gas, air, and 110- and 440-volt a-c current. Compressed air is supplied by six 100-hp Ingersoll Rand compressors installed in a pump building close to the steel storage area. The main repair shop has gantry cranes spanning one track, and both production tracks have pits for a portion of their length. Adjustable scaffolding can be installed along both tracks.

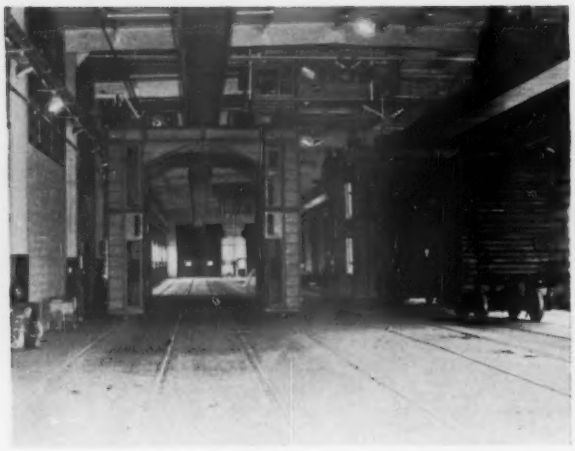
Cars move from the main repair shop into an open-sided structure where they are sandblasted. From here they are moved over pits where they are undercoated. The open-side shelter connects the main repair shop and the paint shop. Cars are not exposed to the weather from the time they enter the main repair shop until they emerge from the paint shop.

The paint shop is a 325- x 51-ft building. On one track is a fully automatic Binks traveling paint spray



1. Stripping area
2. Steel yard, 200 x 75 ft
3. Fabricating shop, 250 x 75 ft
4. Blacksmith shop, 100 x 75 ft
5. Main repair shop, 600 x 100 ft
6. Machine shop, 100 x 75 ft
7. Truck shop, 100 x 75 ft
8. Lumber storage and mill, 125 x 125 ft
9. Storeroom, 125 x 75 ft
10. Shop office, 46 x 25 ft
11. Lunch room, 77 x 25 ft
12. Locker room, 130 x 25 ft
13. and 14. Undercoating and sandblast area, 300 x 70 ft and 200 x 51 ft
15. Paint shop, 325 x 51 ft
16. Paint storage and locker room, 137 x 25 ft
17. General office, 59 x 40 ft
18. Compressor building, 40 x 24 ft
19. Fuel oil storage

A. Bridge crane, 70 ft and 10 ton
B. Bridge crane, 96 ft and 15 ton
C. Gantry crane
D. Automatic paint spray booth
E. Hand paint spray booth



Two-track paint shop has left-hand type traveling spray booth and fully automatic booth (right).

Erie sprays stencilling and emblems on its repaired cars. Single-coat hot spray enamel is used for finishing cars.

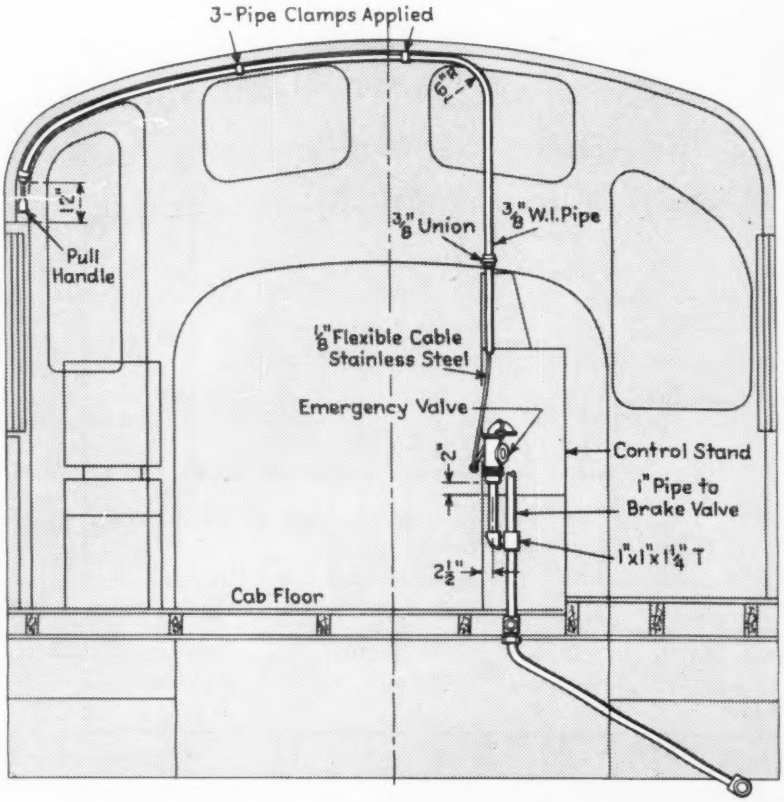
booth. On the other track is a hand type booth. Since these booths went into operation, the Erie has been applying a single-coat, direct-to-metal paint. A crossover between the two repair tracks makes it possible to move repaired cars under either the automatic or the hand-spray booth, or to perform part of the finishing under one booth and transfer the car to the other for completion. Cars are moved from the shop and lightweighted in Meadville yard where stencilling is completed.

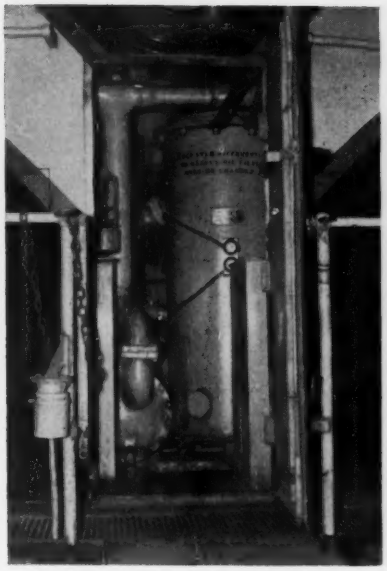
The shop today provides the Erie with facilities for making production line car repairs. Its location has simplified the movement and storage of ars requiring these repairs. The shop is close to the plants of many suppliers. The Erie has a shop which makes it possible to keep close control over car repair costs in the years ahead.

AAR Begins To Clarify ICC Ex Parte 174

The special Committee of the Mechanical Division dealing with interpretation of ICC Ex Parte 174 has issued information on two sections of the new Locomotive Inspection Rules. Rule 226(a) requires removal of mill scale, oil, grease and other material from wheels which might conceal cracks. AAR Spec M-107 covering manufacturers' handling of new wheels is being revised. The Committee advises that investigation has shown that no protective coating should be necessary to prevent rusting prior to use of the wheel except in the most exceptional cases.

The Committee also issued the drawing of one railroad showing an arrangement complying with Rule 204(b) which requires a means of stopping a locomotive from the fireman's side of the cab. The arrangement has been discussed with representatives of the Bureau of Locomotive Inspection.





Full-flow filter system performance on F-M road switcher is checked with oil analyses.

Spectrographic analyses of P&WV oil samples are made on this 61-channel machine at Spectrochemical laboratory near Pittsburgh.

What Spectrographic Control Does for P&WV

Elimination of engine failures, policing of programmed maintenance, and tests of new equipment are all important to this road which works with commercial laboratory.

"I cannot see how diesel operation can be performed without the use of spectrographic analysis," W. C. Kresge, general superintendent of the Pittsburgh & West Virginia told us recently. "We know very little about a diesel engine, so any help we can get is to our advantage." "The spectrograph," he continued, "does give a positive check on whether the maintenance procedures we set up are being followed."

Making spectrographic control successful on this 132-mile line requires an approach different from that used by larger roads. The motive power fleet consists of 26 Fairbanks-Morse road switchers and a single Baldwin yard unit. "For our ownership," Mr. Kresge said, "I could not justify the purchase of a spectrograph and its allied equipment."

To do the job of determining the quantities of a series of elements in its oil samples, the P&WV turned to commercial laboratories. In operation since 1953, this plan not only locates potential engine failures and serves as a method for policing programmed maintenance; but it has been vital in weighing the effectiveness of a series of lube oil and engine air filtering systems which the road has tested.

Since 1954, this line has been having its spectrographic analyses made by Spectrochemical Laboratories of Pittsburgh. This organization receives a sample from the crankcase of each P&WV diesel a day or two before the unit is scheduled for its monthly test. Following analysis in its Quantometer, the laboratory phones the result to the P&WV shop at Rook on the southwest edge of Pittsburgh where the railroad performs all of its rolling stock maintenance. The telephoned results are confirmed by a written report the following day. Any necessary work or inspections can then be performed in conjunction with the monthly test after the locomotive comes to the shop.

The P&WV has found that results must be recorded and compared for some time before standards for engine maintenance can be developed. Likewise, interpretation of the results require a knowledge of the locomotive's history, and the maintenance procedures which have been used.

When the initial results were recorded after the P&WV adopted spectrographic analysis, it was found that the lube oil in the crankcases of all units contained high levels of silicon and iron. The high iron content could be confirmed readily by the cylinder liner wear being experienced. The silicon level indicated that air filtering was not too effective. Investigation finally revealed that the impingement-type air filters were not getting enough oil on them because they were not being dried sufficiently after they had been through the washing machine. A change in procedure soon cleared this condition.

On numerous occasions, the laboratory results have shown that engines were experiencing part failures which would be serious later. Locomotive 52 once showed a lead level about four times higher than customary. At the time, all of the main bearings in this engine had been converted to aluminum. However, the thrust bearing was still of the copper-lead type. Investigation showed that this bearing was breaking down, and detection undoubtedly prevented the

scoring of the engine's crankshaft.

On another accasion, the oil from Locomotive 53 showed an iron level about twice that regarded as satisfactory. Rook shop went through the standard sequence of inspections followed in this case. After examinations of rings, pistons and finally liners had revealed no trouble, the high iron was found to be coming from a worn bushing in the vibration damper. A complete failure would have been both serious and costly.

Locomotive 71 was built with an Air-Maze oil-bath engine air filter. On three occasions within a single month, laboratory reports showed high silicon in its crankcase oil. The source of this, finally found, was failure to install a new gasket on the oil bath filter bowl when replacing it after servicing. With another gasket properly installed, the silicon level dropped back to well within its normal range.

What They Mean

According to Mr. Kresge, the silicon level in crankcase oil should receive first consideration. It can be told whether engine air filters are being cleaned and whether lube oil filters are being changed. Particles of dirt which do get through the air filters should be removed subsequently by the oil filters. Silicon in the oil has been found to be most effective in checking on the activities of maintenance men. Actually some silicon is always present. Filters cannot remove all dirt, and most lubricating oils have a silicon-containing compound to prevent foaming, but which causes no engine damage.

Iron levels tell the real story. When they get to be over 60 parts per million (ppm) the trouble can be broken rings, cracked pistons, or worn and scored liners on Fairbanks-Morse power. On some occasions, high iron may mean the breakdown of components which are not parts of the combustion assembly, as it was in the case of the vibration damper on Locomotive 53.

The road uses a boron water treatment and presence of this element in the crankcase oil is an indication of water leaks. While aluminum is measured, it has been found that the levels are not significant. The aluminum bearings in Fairbanks engines show very little wear and there is not the gradual increase in concentration of aluminum which is experienced with lead and copper in the Baldwin yard locomotive.

Although the F-M locomotives have so far operated without aluminum bearing troubles, the P&WV men feel that spectrographic analysis would not be too effective in forecasting them. Actually, the elements reported to the P&WV by Spectrochemical Laboratories are silicon, iron, chromium, aluminum, tin, lead, copper and boron.

Testing New Equipment

On a short road like the P&WV, it is impossible to assign a unit so it will accumulate mileage rapidly enough to make possible an accelerated test of some new locomotive component. Here, too, the spectrographic reports play a part.

Although P&WV diesels make only about 40,000 miles per year, a number of them have served and are serving as mobile proving grounds for new equipment. A series of tests in which Spectrochemical Laboratories' results play a part have led to a program of replacing the original panel-type engine air filters with Air-Maze oil-bath and Farr Rotonamic filters. Even though the reduction in man-hours involved in servicing these new filters was the biggest factor in justifying them, the filtering efficiency shown by tests of the crankcase oil was also important.

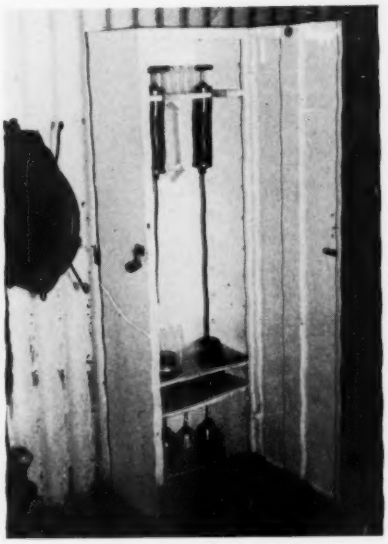
Take one of the railroad's reports made about Locomotive 71, which was the first P&WV unit to have the Air-Maze oil-bath filter. Fairbanks-Morse installed this one when the unit was built at Beloit. "In many cases," the P&WV report says, "silicon is about the same on other locomotives as on the 71. On them, dirt gets through the panel filters, past the rings and into the lube oil where it is filtered out. In nearly all cases, iron content is much higher on other units than on the 71. The oil-bath filter prevents dirt from entering the engine, while others depend on oil filters taking the dirt out of the oil after it gets into the crankcase."

Another series of tests have been conducted with engine oil filters. Again servicing man-hours must be combined with filtering ability in weighing results. For a year, Locomotive 63 had a full-flow filter system made by Engine Life Products Company.

The ability to operate efficiently for much longer periods between filter changes is steadily being checked by the results which come back regularly from Spectrochemical Laboratories.

Regular analysis of crankcase oil is an accepted part of the maintenance and operation of P&WV locomotives. Analysis of the samples from the road's 27 units costs less than $150 per month. The protection and information which these analyses yield is worth many times this. Because a spectrograph could not be justified, the road relies on a commercial laboratory. It is well satisfied with the impersonal, accurate results which it gets.

Cleanliness Is Vital In Taking Samples



Sampling equipment is kept in neat metal cabinet in P&WV enginehouse. Sample guns hang on racks. Procedure followed is specified by commercial laboratory making spectrographic analysis. First step is to clean gun by pumping it two or three times in clean kerosene. After discharging this and wiping the gun with absorbent paper, the sample is taken. The engine must have been running at least 20 min and temperature must be 120 deg F or more. The gun is pumped two or three times in the crankcase before sample is finally drawn. The oil is then discharged into a small plastic bottle which is immediately capped. Spectrochemical Laboratory supplies clean bottles and shipping containers.

GIVES LONG SERVICE AT WIDE RANGE OF OPERATING TEMPERATURES

Arapen RB 350 is another new Esso product designed to reduce railroad operating costs. Perfected by Esso Research, Arapen RB 350 is now available to offer you a combination of lubricating advantages required for anti-friction journal bearings.

Arapen RB 350 provides unexcelled lubrication from –30° to 250°. In the coldest weather, it remains soft and provides maximum lubrication. And at the highest temperatures, it provides a tenacious lubricating film needed under full-load conditions.

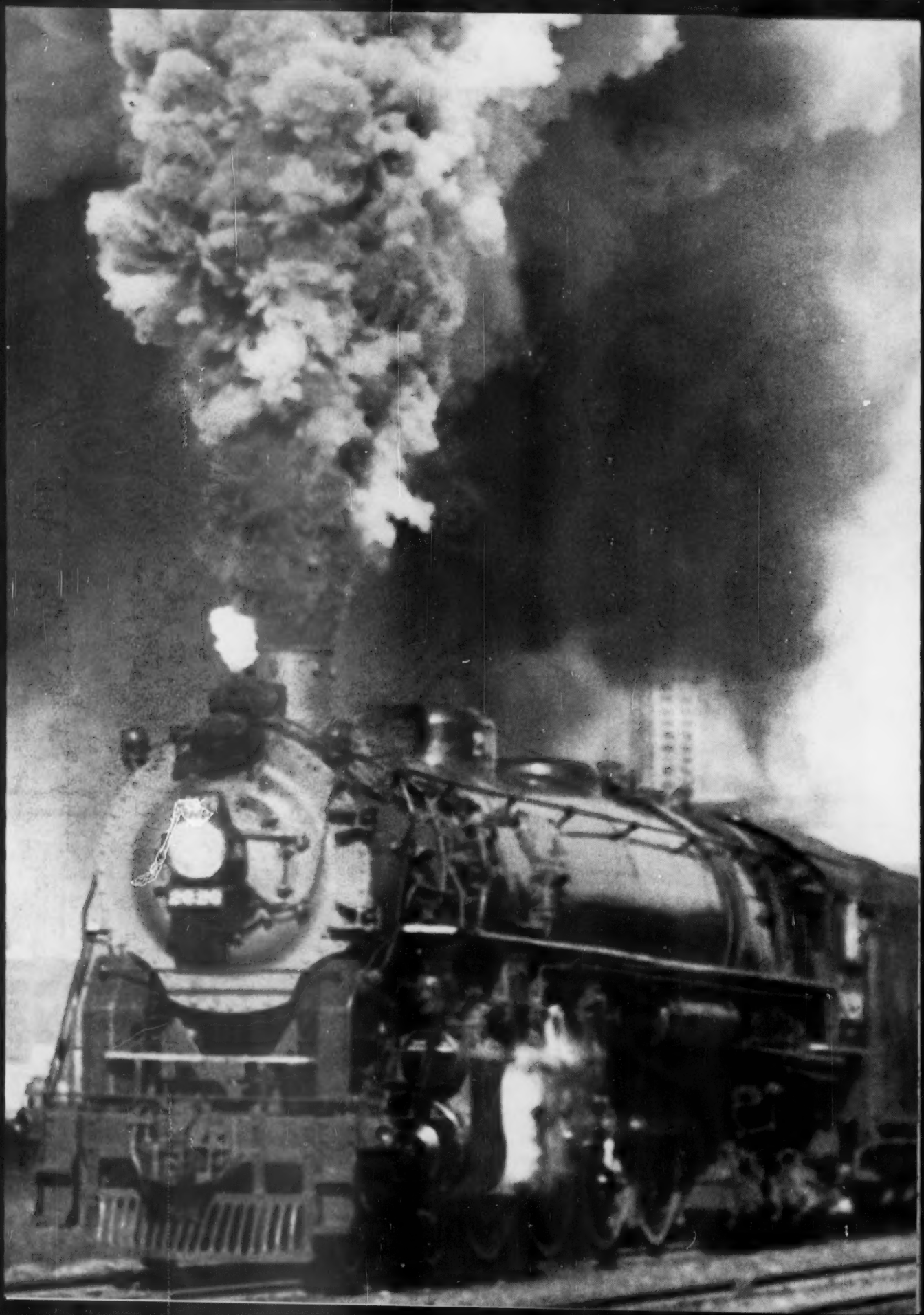
Arapen RB 350 passes the difficult 100,000 double stroke test without appreciable change in consistency. This remarkable sheer stability means Arapen RB 350 "stays put" without softening, gives excellent and long-lasting lubrication, reduces leakage through seals, requires less make-up grease.

For more information on the performance of this outstanding new grease, and for expert technical assistance available through an Esso Sales Service Laboratory, write: Esso Standard Oil Company, Railroad Sales Division, 15 West 51st Street, New York 19, N. Y.

Esso

RAILROAD PRODUCTS

In Industry after Industry..."ESSO RESEARCH works wonders with oil"



COLLECTOR'S ITEM

VALUE: $288,000,000

THIS is the "Four Aces". And like all steamers, it commands a special spot in the hearts of railroaders. But this particular locomotive is something extra special. It fired up an idea that can save the railroads at least $288,000,000 a year in operating and maintenance costs.

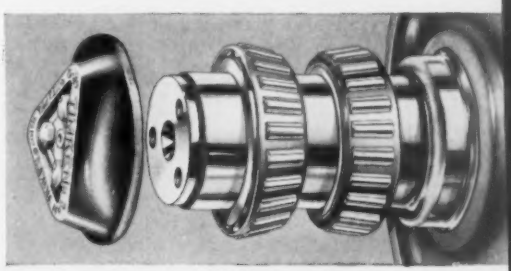
The "Four Aces" was the first locomotive in America completely equipped with roller bearings . . . Timken® tapered roller bearings. It was built by the American Locomotive Company at Schenectady in 1929. It proved that tapered roller bearings could take the load . . . run at high speeds without hot boxes.

This pioneering step paved the way for "Roller Freight". It's an example of how the Timken Company has worked with the railroad industry over the years.

Now we're reaffirming our partnership with the railroads. We built a special plant that uses revolutionary methods to produce freight car roller bearings—up to 20,000 car sets a year. This unique plant is designed to help the railroads go "Roller Freight" on a planned basis—make it possible to go "Roller Freight" at minimum cost.

Today 71 railroads and other car owners have more than 26,600 cars on Timken bearings—⅓ of them in interchange. When all freight is "Roller Freight", the railroads will save that $288,000,000 yearly—$144 per car. Why not talk to your railroad friends about this planned conversion? Let your new railroad roller bearing plant help you start your savings now. The Timken Roller Bearing Company, Canton 6, Ohio. Cable address: "TIMROSCO". Makers of Tapered Roller Bearings, Fine Alloy Steels and Removable Rock Bits.

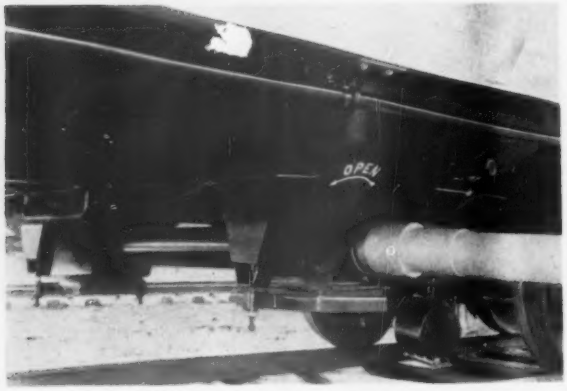
The "Four Aces", 2626, when it was on the Northern Pacific.



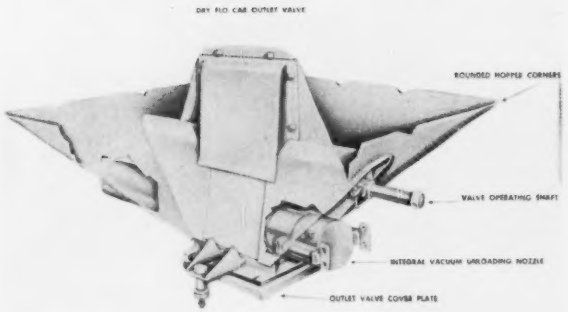
BETTER-NESS rolls on

TIMKEN® **tapered roller bearings**

First in bearings for 60 years



Pneumatic conveying hose can be attached to outlet; or bottoms of hoppers can be attached to track-center chutes. Patented unloading arrangement is contained within the hopper.



Discharge valves for individual hoppers are hinged at top. Pinion on operating shaft engages rack on discharge valve for easy vertical movement. Valve can be positioned as desired.

GATX Introduces Dry-Flo Covered Hopper

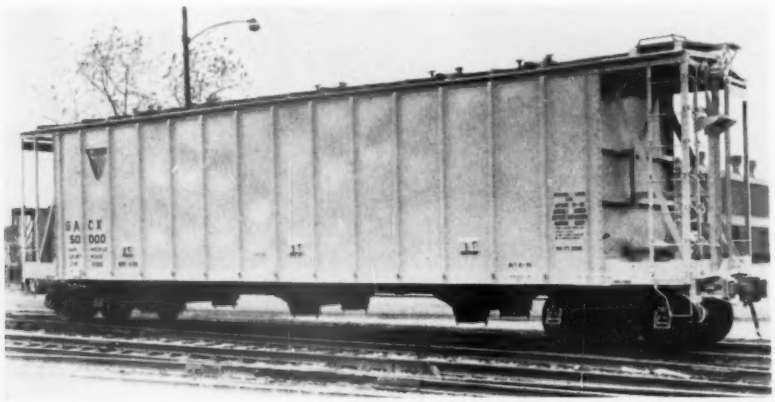
General American's new Dry-Flo covered hopper car features an exclusive design of unloading gate and all rounded hopper corners. The car comes in two sizes—3,500 and 2,450 cu ft capacities—and is built to handle products not subject to fluidization. Overall dimensions are identical to that of the 3,600- and 2,600-cu ft Airslide cars, and the same jigs and dies are used in construction. The only basic difference is the outlet hoppering arrangement.

The unloading gate is located completely within the car to exclude foreign materials and eliminate troubles met with conventional exterior gates. The unloading gate valve opens vertically and is not affected by commodity pressure or flow. It also permits easy adjustment of flow of lading when unloading. Hopper slope sheets vary from 45 to 55 deg from the horizontal. All hopper corners are rounded to a 2½-in. radius with no joints, insuring minimum product retention. Key factors of the car are said to be ease and economy of unloading plus perfect sanitation. It is competitive in price with other covered hoppers.

Loading can be done by gravity, mechanical or pneumatic means into the roof hatches of the car. Pneumatic nozzles designed for vacuum unloading systems are arranged so as not to interfere with gravity unloading. The entire unloading can be done from one side of the car, requiring only half as many connections of the conveying hose. Flow of material from either side of the car is under complete control of the operator. The car can be emptied by vacuum or pressure pneumatic systems, by gravity feed into hoppers below the track, or by any mechanical conveying system. When ready for transit, the discharge outlet opening is protected by an additional rubber gasketed steel cover. All unloading equipment presently designed for the Airslide cars can be used interchangeably in unloading the Dry-Flo.

As in the Airslide car, the carlines are reversed and are on the outside of the roof. This leaves a smooth, unbroken interior ceiling with no projections and makes cleaning easy. The roof is continuously welded to the sides and ends, providing air-tight construction. Loading hatches are standard Airslide rigid cast aluminum covers with rubber gaskets. Each car must stand 2½-lb air pressure before it is released. The Dry-Flo is built in two styles and each car can be equipped either with 50 or 70-ton trucks. The 3,500-cu ft unit can have three compartments with six gravity unloading gates and/or three pneumatic unloading nozzles; the 2,450 unit, two compartments with four unloading gates and/or two unloading nozzles. The carbody is all welded construction which, in addition to the roof design, permits interior coatings.

The car will handle dry products such as malt, shelled beans, peanuts, soybean meal and similar feed ingredients; plastics, such as polystyrene, polyethylene; dry chemicals, and detergents. Present orders include 100 for the Burlington and four to be leased to Quaker Oats.



Dry-Flo hoppers come in two sizes. The 3,500-cu ft model above has ten roof hatches; smaller 2,4500-cu ft car has six hatches. GATX puts carlines outside of roof to produce smooth interior.

New York Central System Photo 58-45

Self-propelled rail car, equipped with efficiency in mind

EX-CELL-O PINS AND BUSHINGS GIVE YOU PERFORMANCE BONUS

Rocketing into the night, this rail diesel car is using safe and secure Ex-Cell-O Pins and Bushings. Why do so many railroad men count on Ex-Cell-O pins and bushings for efficiency?

One reason is the durable outer casing that takes severe stress in stride. Another reason is the soft ductile core that takes the shock out of strain. But the best reason is that railroad men *know* every Ex-Cell-O pin and bushing often offers up to a million miles of service. Well-stocked warehouses assure express-speed delivery, and an exceptional service policy guarantees satisfaction long after the sale. Available separately or assembled.

Why not contact your Ex-Cell-O Representative or Ex-Cell-O, Detroit, soon.

EX-CELL-O CORPORATION

Railroad Division

EX-CELL-O CORPORATION
DETROIT 32, MICHIGAN

EX-CELL-O FOR PRECISION XLO

SIOUX impact offer Torque

BIG "SLUGGERS!"

The Sioux No. 320 and 322 air impact wrenches achieve a new high in power to weight ratio. Certified torque as shown in specifications with 8 points of power selection makes them most ideal for heavy duty work.

More than MEDIUM!

No. 315 and 316 are popular industrial and general use sizes with great versatility of use and power for extra punch. They're designed for use where power is required beyond that of conventional ½" drive wrenches.

Medium POWER

No. 315 and 316 cover a torque range adequate for many purposes. They're thoroughly tested and proven. Thousands are in daily use.

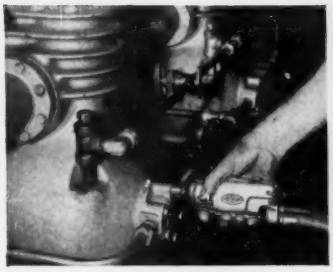
SIOUX *Electric*

IMPACT WRENCHES

Sioux electric impact wrenches offer equal power in right or left hand rotation. The torque for each wrench is stated and certified. Their mechanical design offers exactly the same advantages as that of the air wrenches. Their exclusive reverse cap switch lock prevents reversing with the current on, and eliminates burning commutator brushes and switch contacts. They are unexcelled in performance.

wrenches

for every task!



CERTIFIED SIOUX POWER

SIOUX tells you the torque your air or electric impact wrench will deliver. (See specifications.) You don't buy just a wrench. You buy certified SIOUX power! Reversible power. And on air wrenches controllable power through eight point power selector.

PROVEN EFFICIENCY

Here, the advantage of the exclusive SIOUX mechanical design is revealed! You can expect your SIOUX air impact wrench to deliver *25% more torque* while *consuming 30% less air!* Less power is absorbed by the wrench itself. More is applied to the drive!

FIELD TESTED, TIME TESTED PROVEN DEPENDABILITY

The exclusive SIOUX impact wrench mechanical design has passed the toughest test of all . . . the test of time. Thousands have been giving dependable, trouble-free service for years.

REACTION BALANCED for Less Vibration Feedback

All SIOUX Impact Wrenches are "reaction balanced" for less vibration and torque feedback and for minimum operator fatigue. You can feel the difference!

ANGLE ATTACHMENT— used directly on the square of the impact wrench to reach those hard to get at spots.

Production type No. 313, 314!

AIR IMPACT WRENCHES

These models feature an exclusive remote air exhaust that takes exhaust 6 feet from the operator. Quiet, clean operation. Production type design with paddle switch, and 8 point torque selector.

No. 303 AIR IMPACT SCREWDRIVER

Same as above except takes ¼" hex drive shanks for clutch head, Reed and Prince, standard, and Phillips screwdriver bits, and for Allen type socket heads.

Compare the TORQUE! the QUALITY!

Cat. No.	AIR Square Drive	Cap. Belt Size	Torque Ft. lbs. at 90 lbs. Air Pressure at Tool
313	3/8"	3/8"	60
314	1/2"	7/16"	75
303*	1/4" Hex		
315	1/2"	5/8"	.130
312*	7/16" Hex		
316	1/2"	5/8"	.195
317	5/8"	5/8"	.195
318	5/8"	3/4"	.250
319	5/8"	7/8"	.425
320	3/4"	1"	.750
322	1"	1 1/8"	1000

*AIR SCREWDRIVER Cat. No.	ELECTRIC Square Drive	Cap. Belt Size	Torque Ft. lbs. in 10 sec. operation Right or Left
323	3/8"	7/16"	75
333	1/2"	7/16"	75
325	1/2"	5/8"	.125
330	1/2"	5/8"	.175
335	5/8"	5/8"	.175

ALSO NO'S. 260, 262, 242, 246 ELECTRIC SCREWDRIVERS

SIOUX's the BUY!

ALBERTSON & CO., INC. SIOUX CITY IOWA, U.S.A.

AIR IMPACT WRENCHES • AIR SCREWDRIVERS • DRILLS • "PELICAN" NUT ACCUMULATORS • FLEXIBLE SHAFTS • ELECTRIC IMPACT WRENCHES • GRINDERS • SANDERS • POLISHERS • SCREWDRIVERS • PORTABLE SAWS • VALVE FACE GRINDING MACHINES • ABRASIVE DISCS

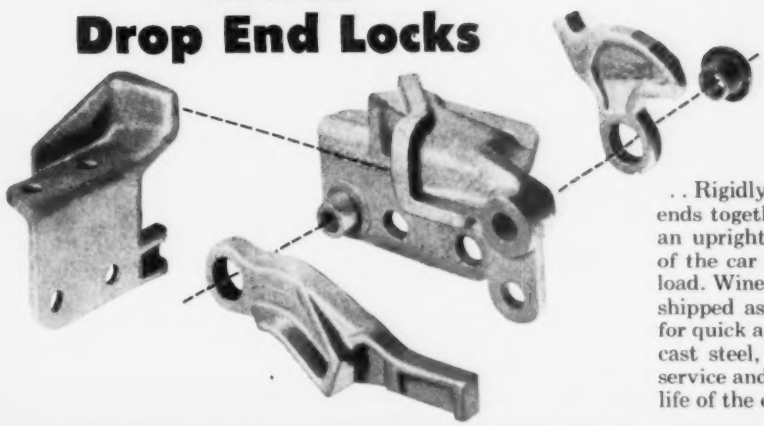
Cast Steel INCORPORATED DROP END UNITS Speed

Inside view—showing top corner interlock and bottom corner hinge trunnion.

Service.. Sustain Structure

For outstanding economies . . . increased safety factors . . . improved strength and durability for the life of the car—Wine Drop End Units (Locks and Balancers) form *the perfect* combination!

WINE
Drop End Locks



. . Rigidly interlock gondola sides and ends together—securing the ends in an upright position. Top corners of the car cannot spread regardless of load. Wine Drop End Locks are shipped as an assembled unit, ready for quick application. Made of electric cast steel, they insure maximum service and durability throughout the life of the car.

WINE
End Balancers

. . . Eliminate the necessity of using *four or five men* to close a drop end for car loading! Multiple spring steel torsion bars, incorporated between the center casting and the two outer hinge trunnion castings, permit *one man* to readily close the heaviest drop ends without assistance. Available for easy application on most drop end gondolas.

THE WINE RAILWAY
APPLIANCE COMPANY
TOLEDO 9, OHIO

Mandatory Date 11 Months Away . . .

Today's Journal Lubricator Situation

Before many months have passed, a half-million US and Canadian freight cars will be equipped with journal lubricators. At the moment, there are 27 devices approved for test application including the eight shown below, and 19 previously described (March 1958). Car owner members of the AAR have just voted on a proposed journal lubricator specification abstracted below.

Less than 11 months from now—on Jan. 1, 1960—the use of these devices is to be mandatory on all interchange freight cars. In addition to cost problems, railroads are confronted with the proper free-oil level to be carried, the development of satisfactory seals, and installation of suitable reclamation plants. It must be realized that the improved performance and reduced servicing resulting from use of these devices is purchased at the price of higher initial investment.

Proposed AAR Lubricator Specification . . .

"These specifications cover devices for the lubrication of journals under cars operating in interchange service. . . . Any proposed device shall be approved for limited test application by the Committee on Lubrication of Cars and Locomotives prior to being applied in interchange service. The basis for approval is provided by this specification. . . . Lubricators shall be required to pass the prescribed AAR laboratory tests in order to qualify for committee authority to test the lubricators in interchange road service. An original allotment of not more than 3,000 car sets of any one lubricator shall be made, based upon the laboratory performance of the lubricator. However, where any detail of the lubricator is questionable, the committee may allot a smaller number of lubricators for road tests. On the basis of the performance record of the lubricator, the committee may, upon request from time to time, authorize additional allotments.

"In order for a lubricator to receive conditional approval, it shall experience a minimum of 18 months' service under at least 3,000 interchange cars with no more than 105 hot box set-outs per 54,000 car months of active service. The 18-month period shall be considered as beginning on the date that 3,000 car sets have been applied as reported to the AAR by the car owners. Such groups of lubricators shall be capable of operating for this period without requiring renewal aside from hot box causes, except that other renewals which might be due to adverse conditions in the journal box assembly will not be counted in this evaluation.

"In order for a lubricator to obtain approval, it shall perform satisfactorily in service for a period of twenty-four months, after which it shall be capable of being satisfactorily renovated in accordance with the requirements of AAR Specifications M-910-A. After renovation, the lubricator shall again pass the prescribed AAR Laboratory Tests as required of new lubricators for test application. The renovated lubricator shall perform satisfactorily for an additional 24-month period. At the discretion

These Devices Got Test Approval in 1958

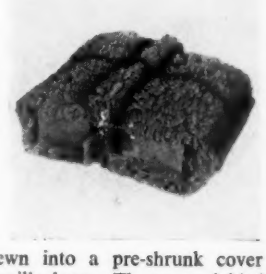
Almco Lubricator Pad

Albert Manufacturing Co.
4912 Hohman ave.
Hammond, Ind.

Cotton outer blanket with lamp-wick type tufts surrounds a felt pad. This covering is placed over a canvas jacket which surrounds a pair of spring steel assemblies which insure contact with the journal.

Absco Lubricating Pad

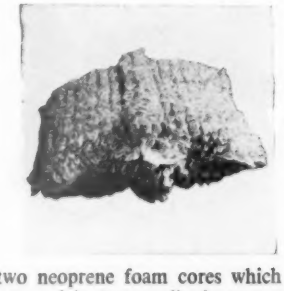
American Brake Shoe Co.
530 Fifth ave.
New York 36, N.Y.



Two foam-neoprene cores are sewn into a pre-shrunk cover which is covered with twisted chenille loops. There are folded fabric retainers on the sides and a central wicking section. The pad is reversible.

Wikit Journal Lubricator

Callaway Mills, Inc.
295 Fifth ave.
New York 16, N.Y.



Cotton-loop pile jacket covers two neoprene foam cores which are separated by a special center wick. Loop pile is woven integrally with jacket and is treated to insure good absorbency and wicking.

Magnus Lubricator Pad

Magnus Metal Corp.
Subsidiary National Lead Co.
111 Broadway
New York 6, N.Y.

Reversible, twin-lobe pad has two elliptical-spring cores covered with felt inner liner and a tufted cotton jacket. Each lobe is laced with eight wicks and its three springs insure proper journal pressure.

of the committee, approval may be granted to a lubricator upon satisfactorily completing 24-months' service on at least 3,000 car sets in interchange if the lubricator is of a disposable type. Lubricators of this type must perform with a hot box set-out rate of not more than 105 set-outs per 54,000 car-months during this twenty-four month period. No lubricator may be accorded full AAR approval unless it meets AAR specifications.

Application and Removal

"The device shall be readily applicable to all journal boxes, of that size for which the lubricator is designed, including the integral and separable types as well as those containing waste retainer ribs and/or journal stops. It is preferable that the design of the lubricator be such that it may be applied or removed without jacking the journal box. However, the wedge and bearing may be moved and the journal lowered in order to facilitate installation and removal. The device shall be capable of being applied without the use of special tools.

"The device shall be equipped with suitable pullout straps or non-ferrous attachments so that it can be readily removed from the journal box without the need of packing hooks contacting the body of the lubricator. The pull out strap or attachment and its bond to the lubricator shall withstand a minimum tensile load of 250 lb without failure throughout the life of the lubricator. The device shall be capable of being removed without the use of special tools.

"All parts of the device shall be readily applicable or removable without dismantling the truck, making permanent modification to the box, or welding or brazing attachments thereto so as to make the device readily interchangeable with all other approved lubricators for the same size journal assembly.

"The device shall be so designed that, under service conditions, it shall remain in its operating position within the journal box without the necessity of appendages which, if used, would involve modification or permanent alteration to the box.

"Each device shall bear a non-ferrous metal tag stamped with the size and the name of the lubricator so as to be legible throughout its life. If relevant, the tag or the lubricator shall indicate which face of the lubricator is "up" and which face is "front" when placed in the journal box.

Materials

"The materials used in the construction of the device shall be as lint free as is possible in commercial production. The material that contacts the journal shall, under service conditions, be immune to reduction in oil wicking ability due to glazing or to accumulated foreign matter. The surface material of the lubricator in contact with the journal shall be such that the accumulated foreign matter therein shall no be conveyed to the bearing by the oil film. If chenille loops or the equivalent are used, they shall be secured to the body of the lubricator so that they cannot be pulled out readily or separated from the cover or backing. Core materials shall not be adversely affected under service conditions, nor shall they lose their resiliency in service, including the entry of rain or snow into the journal boxes followed by subzero temperatures and freezing, to the extent that the lubricator fails to contact and adequately feed oil to the journal. After being given approval for road tests, no changes may be made in the design, material, method of manufacture, manufacturer, nor the type of equipment on which the lubricator is made, without proper authority.

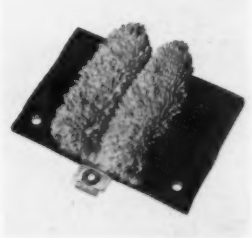
"While the device may have several component parts, it is desirable that the finished lubricator consist of one unit assembly for each journal box. If metal springs or parts are employed within the device, they shall be securely anchored and shielded so that, through service wear, the metal will not become exposed and contact the journal. The use of bare metal appendages for positioning or securing the lubricator within the journal box is not desirable.

Free Oil

"The device shall be so designed that the core material or the presence of a suitable dam will reduce excessive movement of the free oil in the journal box. In service, the lubricator shall feed and function satisfactorily with a maximum of ½ in. of oil in the journal box and continue to feed oil adequately until all of the free oil in the journal box has been used. The design of the lubricator shall be such that the oil retained at its journal contact surface shall be sufficient to lubricate the bearing and the entire journal at subzero temperatures, found in service, until operating temperatures restore adequate feeding."

Premier Journal Lubricator

Premier Manufacturing Corp.
107 Penn ave.
Pittsburgh 21, Pa.



Two duck-covered, foam-neoprene cores are mounted on wool-felt base which forms oil reservoir. Chenille wicking loops pass through covers, cores and base; two rows of tufts clear each side of journal.

Armstrong Lubricator

Scullin Steel Company
6700 Manchester Ave.,
St. Louis 10, Mo.

Specially woven wool and cotton pad, formed to fit journal contour, is held on journal by spring-steel frame. Wick feeders extend to oil suply. Phenolic buttons on surface allow wicked oil to circulate.

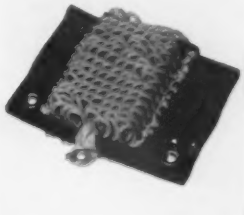
Seaboard Lubricator

Seaboard Lubricator & Mfg Co.
303 W. Johnson st.
Raleigh, N.C.

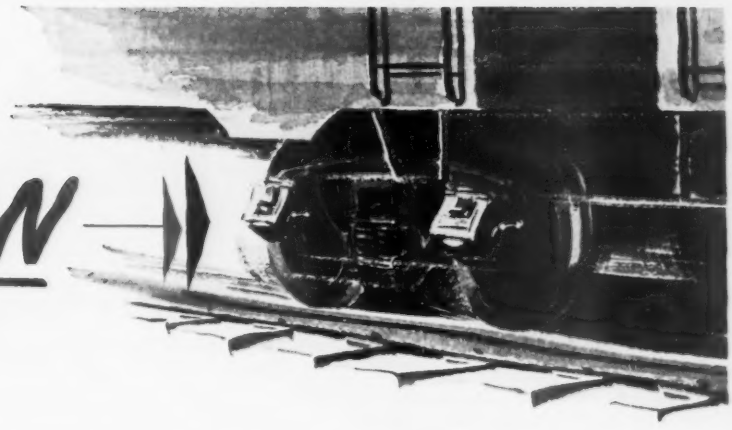
Core of Chemfoam JL supports a wool-and-cotton fabric pad and is designed to maintain contact with the journal. The pad is rolled both clockwise and counterclockwise, and the fabric resists glazing.

Cool-Pak Lubricator

Uni-Pak Corp.
Box 8302, Swissvale
Pittsburgh 18, Pa.



Two-layer felt base has series of 110 to 180 wicks through it. A nylon-wool-cotton blend forming the wicking is woven around stranded, stainless-steel wires which hold wicks against the journal surface.



SOLUTION
hot box problem

Magnus Lubricator Pads and R-S Journal Stops offer a low-cost combination that eliminates the principal causes of hot boxes — makes it possible to get the kind of bearing performance you want without sacrificing any of the advantages inherent in standard AAR solid bearing assemblies.

Now you can greatly increase bearing efficiency and cut overall costs, too. You can get up to 5,000,000 car miles per road failure of a bearing at the same time you cut the maintenance and service attention required. Best of all, you can do this at a price you can afford to pay — right now. You increase new car costs less than 2% — and reduce car maintenance costs over 10% — get your money back in less than 3 years. Here's how:

Step No. 1 — Magnus Lubricator Pads — In the Magnus pad you get all the known best qualities of pad construction in a sturdy one-piece twin-lobe design. There's 3-way wicking (circumferential, internal and center feed) from an abundant oil supply. Each pad holds more than 2.5 times its weight of oil — better than 5.9 pints for the 6" x 11" size. Thoroughly tested elliptical steel springs, completely enclosed and firmly connected, eliminate sponge-type uplift media — assure constant contact of the pad with the journal. Polyurethane cores feed oil to internal wicks and increase the oil reservoir supply, internal wicks are not entrapped — are readily cleaned through normal reclamation process. The cover is heavy pre-shrunk duck, tufted with premium quality cotton yarn and backed by high-capillarity felt. In all, it's a lubricator pad designed by bearing experts to give you the performance you want and need.

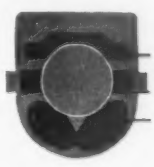
Step No. 2 — R-S Journal Stops — Engineered and pioneered by Magnus, R-S Journal Stops stabilize the entire journal bearing assembly — give the bearing a chance to work at optimum efficiency. They double bearing and dust guard life, will make possible the development and application of a low-cost rear seal. They are a must to get the maximum safe period between re-packs.

R-S Journal Stops keep pads in proper position at all times. Misalignment is just impossible. By restricting axle movement they prevent pad compression, too — will make longer pad life possible, and reduce pad dependence on resiliency to maintain journal contact. You get constant uninterrupted wicking — and when used with the Magnus pad that means the maximum flow of oil to the journal.

Yes, with these two Magnus developments you can get the best in bearing performance *at the lowest possible* cost. And you still have all the advantages of standard AAR solid bearing assemblies — ease and simplicity of maintenance, complete interchangeability (with parts available and applicable at any point on the railroad), highest load and speed ratings, light weight, and all the many others.

Ask your Magnus representative to give you details on the Magnus pad and the R-S Journal Stops. Or write to Magnus Metal Corporation, 111 Broadway, New York 6, or 80 E. Jackson Blvd., Chicago 4.

MAGNUS



SOLID BEARINGS
R-S JOURNAL STOPS
LUBRICATOR PADS

From ICC Bureau of Locomotive Inspection Report . . .

Locomotives Are in Better Condition

The decrease in the number of locomotives found defective during the government fiscal year ended June 30, 1958, reflects "the thorough supervision of and policing by [ICC] field personnel," according to John A. Hall, director of the Commission's Bureau of Locomotive Inspection. This was made possible, the director stated, by the allotment of sufficient travel funds to provide "continued general coverage of all inspection points. . . . The decrease in the number of locomotives inspected reflects, in part, vacancies in the staff of locomotive inspectors throughout the year."

Whatever the reason, the other-than-steam locomotives which were found defective did drop from 10.9 per cent of the total inspected in 1956 to 9.7 percent in 1957, and to 8.8 percent in 1958. At the same time, the number of these units ordered out of service by ICC inspectors dropped from 492 in 1956 to 417 in 1957, and to 372 in 1958.

The director reported that "in furtherance of the program for maintaining uniformity in methods of procedure and inspection practices and to insure uniform understanding of policies, conferences with zone supervisors were held at various times throughout the year. Meetings also were held with groups of district inspectors to discuss the application of new and revised inspection rules which, unless otherwise ordered by the Commission, will become effective January 1, 1959." [*On ICC order dated Nov. 26, 1958, did extend many of these dates—Editor.*]

It is significant that the legislative recommendations of the Interstate Commerce Commission, for the first time in five years, did not contain any reference to amendment of the Locomotive Inspection Act which would make it possible to consolidate the Bureau of Locomotive Inspection with the Bureau of Safety and Service to eliminate "artificial separations of work" between the several types of inspectors. Committee hearings were held in Congress following the recommendation made initially in 1954, but there has been no further action.

Seventy-two accidents occured in conjunction with all types of locomotives, and 86 persons were injured. Compared with the previous year, this was a decrease of three accidents and four injuries. Of the 72 accidents, 21 were caused by defective condition of floors, steps and passageways of diesel-electric locomotives. Eighteen of these 21 re-

Accidents and Resulting Casualties Caused by All Locomotive Failures

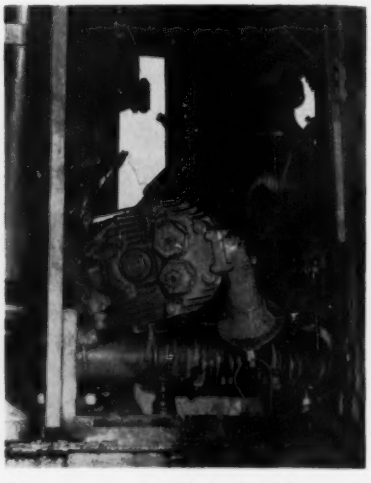
	1958	1957	1956
Accidents resulting in casualties	72	75	73
Casualties (killed and injured):			
Train crew members	73	76	79
Maintenance employees	0	0	2
Other employees	1	2	2
Non-employees	12	12	0
Total casualties	86	90	83
Fatalities in above total	0	0	4

How Frequently Do ICC Inspectors Find Defects on Diesel and Electric Locomotives and M-U Cars?

	Locomotives		M-U cars	
	1958	1957	1958	1957
Units reported	31,755	30,740	2,728	2,745
Units inspected	91,522	93,187	1,747	1,437
Units defective	8,067	9,031	168	119
Total defects	20,668	23,373	272	172
Percent defective	8.8	9.7	9.6	8.3
Ordered from service	372	417	1	2

Break in driving axle of diesel passenger unit occurred approximately at center of the left traction-motor support bearings 6½ in. from the axle gear seat.

Break in the eye of truck swing hanger caused locomotive to be taken out of service by district ICC inspector when it was found during regular terminal inspection.



Air compressor crankshaft bearing failure caused the shaft to seize; and the compressor was torn from its base and rotated to position shown in this ICC photo.

Inside brake lever connecting strap caused unit to be taken out of service by inspector. Strap fouled the inside face of the driving wheel of this locomotive and wore through.

sulted from the accumulation of oil on walking surfaces. In 15 of these accidents, oil accumulations were reported from one to 58 times during the month preceding the accidents. Accidents caused by accumulations of oil on walking surfaces increased 20 per cent over the previous year.

Eight accidents were caused by defective cab seats. There were three such accidents in 1957. Eight other accidents were caused by explosions in the crankcases of diesel engines. These explosions injured eight persons. Six were caused by overheated bearings, one by a defective piston, and one by a crack in a cylinder liner. In 1956 there were seven crankcase explosions causing injuries; in 1957 there were four.

Internal combustion engines, brakes, sanders, fuel systems, and cab floors and decks were the items most frequently found defective by inspectors. During the year two cases involving four alleged violations of the Locomotive Inspection Act were sent to U.S. attorneys for prosecution.

Most Common Defects on Diesel and Electric Locomotives

Partial list of parts defective, inoperative or missing, or in violation of ICC rules found during inspection of 91,522 units in 1958 and 93,187 units in 1957.

	1957	1958
Air compressors	328	232
Boilers	208	172
Brake equipment	2,906	2,469
Cabs and cab windows	1,030	962
Cab floors, aprons, and deck plates	1,940	2,020
Controllers, relays, circuit breakers, magnet valves and switch groups	360	348
Draft gear	253	357
Fuel system	2,431	2,307
Gages or fittings, air	289	166
Handholds	208	217
Inspections and tests not made as required	703	623
Insulation and safety devices	133	228
Internal combustion engine defects, parts and appurtenances	5,174	3,817
Jumpers and cable connectors	442	306
Lights, cab and classification	360	321
Motors and generators	671	472
Sanders	2,023	2,310
Springs and spring rigging, driving and truck	370	380
Steps, footboards, etc.	827	292
Trucks	552	510
Wheels	256	189
Miscellaneous	736	762

From ICC Bureau of Safety and Service Report . . .

Brake Inspections Show Improved Maintenance

The Power or Train Brakes Safety Appliance Act of 1958 became effective August 9. The ICC Bureau of Safety and Service, which will be responsible for supervising compliance with this Act, recently issued its report of brake and safety appliance inspections and investigations for the year ended June 30, 1958. The broader scope of the new Act and resulting power of the Commission promise to intensify brake inspection activities of its inspectors. Results reported by the 1958 report indicate that, even prior to enactment of the new Act, brake equipment was already in better condition than in previous years.

During the year, air-brake tests were made on 2,132 trains of 132 different railroads prior to their departures from terminals. These trains consisted of 98,630 cars. Upon departure, there were only 127 cars with inoperative brakes. However, it was necessary to set out 2,444 cars and to repair 2,868 cars remaining in trains. From the average departing train of 46.2 cars it was necessary to set out or repair 2.49 cars. "Had these trains departed prior to inspection by the Commission's agents," the Bureau reported, "the percentage of operative brakes would have been only 94.4" Inspections of 2,246 departing trains in

Public Law 85-375
85th Congress, S. 1386
April 11, 1958

AN ACT

To authorize the Interstate Commerce Commission to prescribe rules, standards, and instructions for the installation, inspection, maintenance, and repair of power or train brakes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That (a) this Act may be cited as the "Power or Train Brakes Safety Appliance Act of 1958".

(b) Section 2 of the Safety Appliance Act of March 2, 1903 (32 Stat. 943, chapter 976, sec. 2; 45 U. S. C. 9), is amended (1) by changing the semicolon at the end of the third clause thereof to a period, (2) by striking the remaining language of the section, and (3) by adding at the end of that section the following new language: "One hundred and twenty days after the date of enactment of the Power or Train Brakes Safety Appliance Act of 1958, the Interstate Commerce

Power Brake Act of 1958, now in effect, was based on the original AAR "Red Book." Requirements are now part of ICC rules and scope of ICC enforcement is expanded.

1957 had involved 105,324 cars and resulted in setting out 2,905 cars and the repairing of 4,146 in trains. While the number of cars involved in these inspections dropped from 138,302 in 1954 to 98,630 last year, the number set out went from 3,557 to 2,444 and the number repaired from 4,865 to 2,868 in the same five-year period.

Air-brake tests were made on 1,123 trains, consisting of 64,404 cars, upon arrival at terminals in 1958. A total of 98 railroads were involved and the average train had 60 cars. Brakes on 66,199 cars—98 per cent—were operative. The Bureau reported that "of those brakes considered operative, 3,998 or 5.93 per cent were of impaired efficiency due to excessive brake-cylinder piston travel."

Safety appliance inspections during the year showed 56.07 defects per thousand units inspected as compared with 67.05 per thousand in 1957, 60.80 per thousand in 1956, and 53.34 in 1955.

"A total of 1,157,366 freight cars were inspected," the Bureau reported, "and 57,405, or 4.96 percent, of these had defective safety appliances, and 65,317 defects were reported." There were 28,455 passenger-train cars inspected; 1,337, or 4.70 per cent, of these had defective safety appliances, and 1,615 defects were reported. A total of 14,342 locomotives were inspected; 314, or 2.19 percent, of these had defective safety appliances and 362 defects were reported. The condition of freight car and locomotive safety appliances showed improvement, while passenger cars safety appliances were in poorer condition than in 1957.

Eight derailments due to defective equipment resulted in casualties during the year ended June 30, 1958. These were among the accidents investigated by the Bureau of Safety and Service and are those resulting in injuries or deaths. A total of 19 derailments resulted in 11 fatalities and 387 injuries. Only eight of these 19 derailments resulted from equipment failures. Three of these equipment failures were broken journals. One derailment resulted from each of the following causes: false flange resulting from sliding wheel, broken coupler, broken driving axle on locomotive, excessive speed due to ineffective air brakes, and broken axle.

KEY TO SUCCESSFUL RAILROADING

Proof positive... the longer life of

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Users have known for years that National C-1 Trucks provide a smooth, friction-controlled ride . . . and at the same time have longer wear life.

A recent inspection, by a group of railroad men, was performed on C-1 trucks that had been in service nearly a quarter-million miles each. This, and other inspections, showed that the friction control mechanism in National C-1 Trucks is designed for the life of the car.

Proof positive of longer life is provided by the following direct quotes from this inspection report.

AA-9481

Check friction wedge from limit of wear notch.

"Bright and no wear."

Check for broken wedge springs.

"None broken."

Examine convexity of friction wedge rear surface.

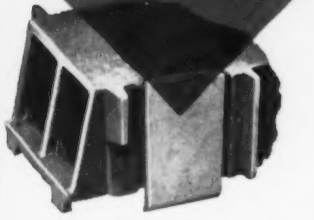
"Bright and very little if any wear."

Check contact between friction wedge and side frame column wedge pocket.

"Slight polish, little wear."

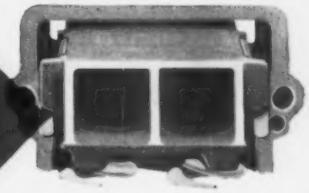
Inspect welds and check wear of bolster friction plates.

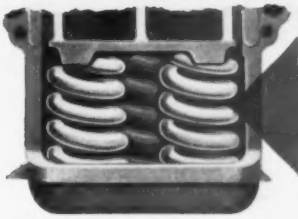
"All welds intact. Friction plates polished with little if any wear."



Inspect bolster column lugs and side frame columns for wear.

"One pad only out of 8 was found worn about 1/16 inch."





Check line of contact between coils of load springs.

"No evidence of having gone solid."

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R I MEMBER

EMD Adopts Flexible Pipe Couplings

Electro-Motive Division of General Motors has changed from rubber hose to flexible couplings on locomotive coolant lines to give the railroads a fitting that requires little or no maintenance. Field tests started in 1954 have resulted in the use of the Marman Flexmaster pipe coupling as a standard replacement of rubber hose 2½-in. and larger in the cooling system. The Flexmaster is also used as a connector replacement in the engine water pump inlets of current production locomotives. The changeover is effective on the SD-9, GP-9, SW-900 and SW-1200 locomotives.

On the GP-9, two short Flexmasters are used on the piping between the radiators and two long ones between the engine discharge piping and the radiators. A slight alteration to the piping is required where the longer coupling is applied adjacent either to the impingement or the centrifugal type engine filter. EMD recommeds that the pipe line leading to the radiator be shortened 6½-in. to allow for pipe misalignment. GP locomotives with an oil bath filter require a 1¼-in. extension brazed to the engine water discharge Y casting.

One short Flexmaster is used on the SD-9 between the engine outlet and the radiators. On the SW-900 and SW-1200's, one short Flexmaster is used between the engine outlet piping and the radiator and one between the radiator and the cooling water tank. With the exception of the GP model, installation time is about the same for a rubber hose or flexible coupling. Standard sizes are 2½-in. on the GP-9 and 3-in. on the SD-9 and SW's. Some of the older model locomotives take the 3½-in. size and the 4-in. is used on some conversions.

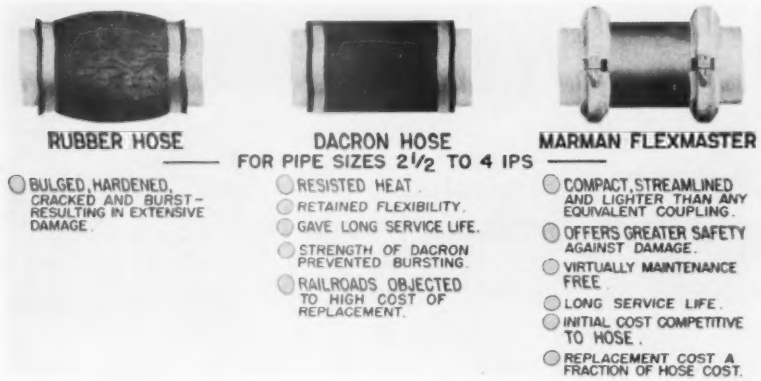
The Flexmaster consists of seven components assembled into a light, compact, streamlined unit with all metal parts plated. There are two cast rings, two Buna N gaskets, two die formed clamps (with bolts and lock nuts) and one spun sleeve. The hinged clamp arrangement is preferred for ease and speed of application. The coupling allows up to approximately five degrees deflection when joining misaligned pipe and permits pipe movement without leakage. The beveled floating ring, mounted at the ends of the coupling, is closely fitted to the pipe outside diameter and prevents the gasket seal from creeping or squeezing out when pressure of the clamp is exerted on it. If any leakage should occur, water would ooze out around the seal requiring tightening of the clamp. When a seal needs replacing, the cost is less than $\frac{1}{10}$ of the cost of a hose.

The purpose of using any type of coupling in the cooling system is to prevent transmission of engine vibrations to the cooling radiators and associated equipment. Any hose will absorb these vibrations but there is always danger that the hose might burst and cause undue damage to the electrical system. The steel Flexmaster coupling offers greater safety against this hazard and is competitive in price with the combined cost of rubber hose and clamps. Once the initial investment is made in the changeover, the maintenance becomes negligible. All parts are reuseable, except the gasket seals.

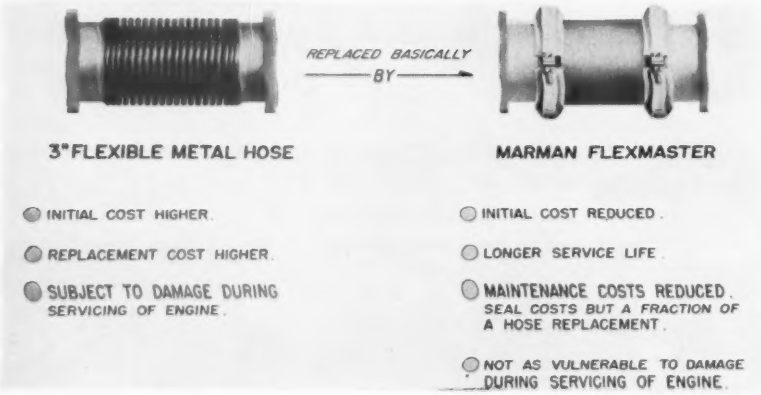
Tests Led To These Conclusions:

- **Replace all hose connections with flexible pipe couplings.**
- **Dresser Style 65 couplings feature same advantages for smaller pipe sizes that Marman Flexmasters do for larger sizes.**
- **For smaller pipe sizes, ½- to 2-in. ips, Dresser coupling, Style 65, is used.**
- **For larger pipe sizes, 2½- to 4-in. ips, Marman Flexmaster coupling is used.**

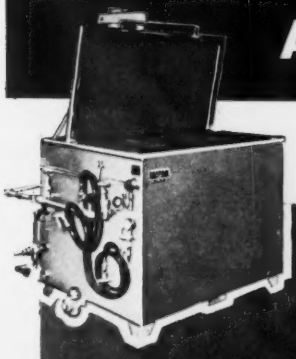
Fabric Hose Replacement . . .



Metallic Hose Replacement . . .



AUTOMATIC FILTER CLEANING



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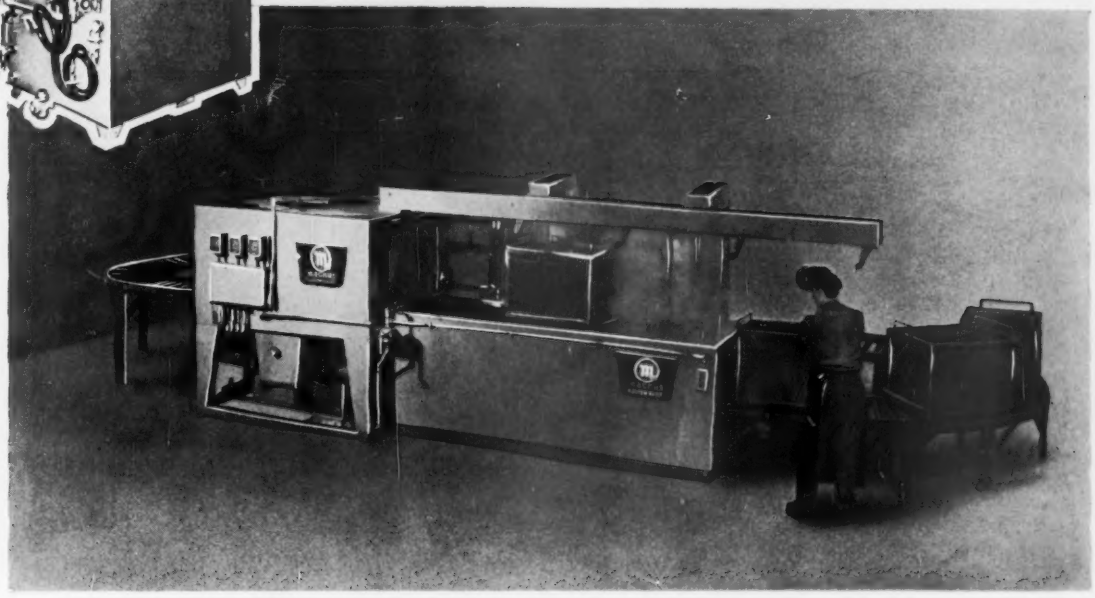

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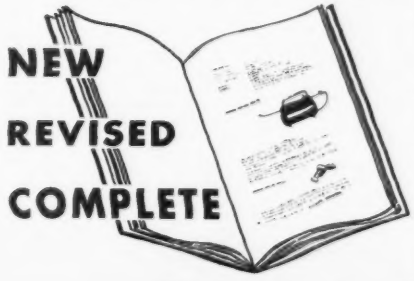

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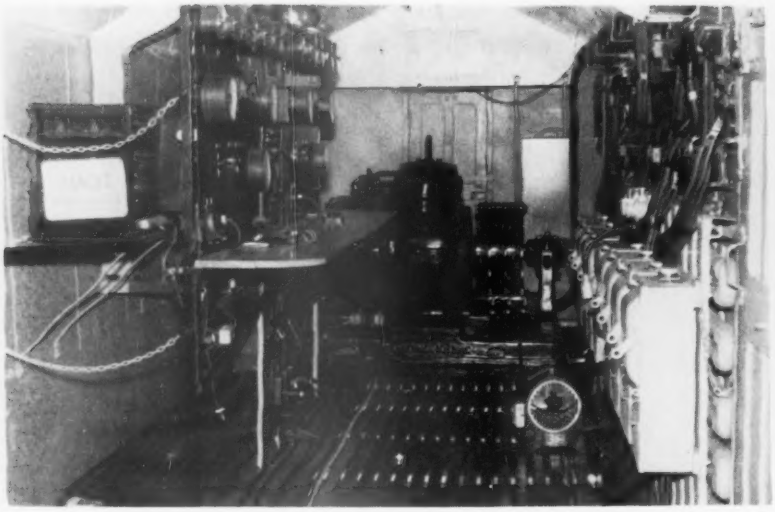
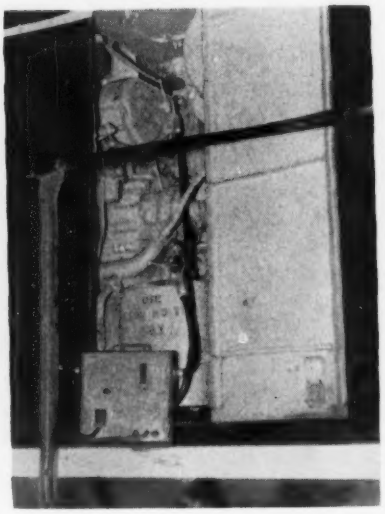


Rotary inverter and control equipment have been installed in baggage car. Second rotary is located in opposite end of the car. Car is used for supplying a-c for special trains.



Auxiliary control for diesel governor has been placed on run board of diesel road switcher.

Inverter Car Powers Parked Trains

By **R. I. Fort**
Electrical Engineer, Equipment
ILLINOIS CENTRAL

RAILROADS FREQUENTLY must cope with the problem of furnishing electric power to passenger cars parked for occupancy at out-of-the-way places. Sometimes special movements must be turned down when the cost of temporary power facilities makes them uneconomical. In many cases, the out-of-pocket charge for a transformer bank installation and removal is a major item in the cost, running to several hundred dollars even though used for only a day or two. Purchase of a high-capacity, self-contained engine-generator set cannot be justified when the fixed charges on the investment are applied to possibly ten days' use in a year.

The Illinois Central finally successfully solved these problems with an unusual inverter car which takes its power from the main generator of a diesel locomotive.

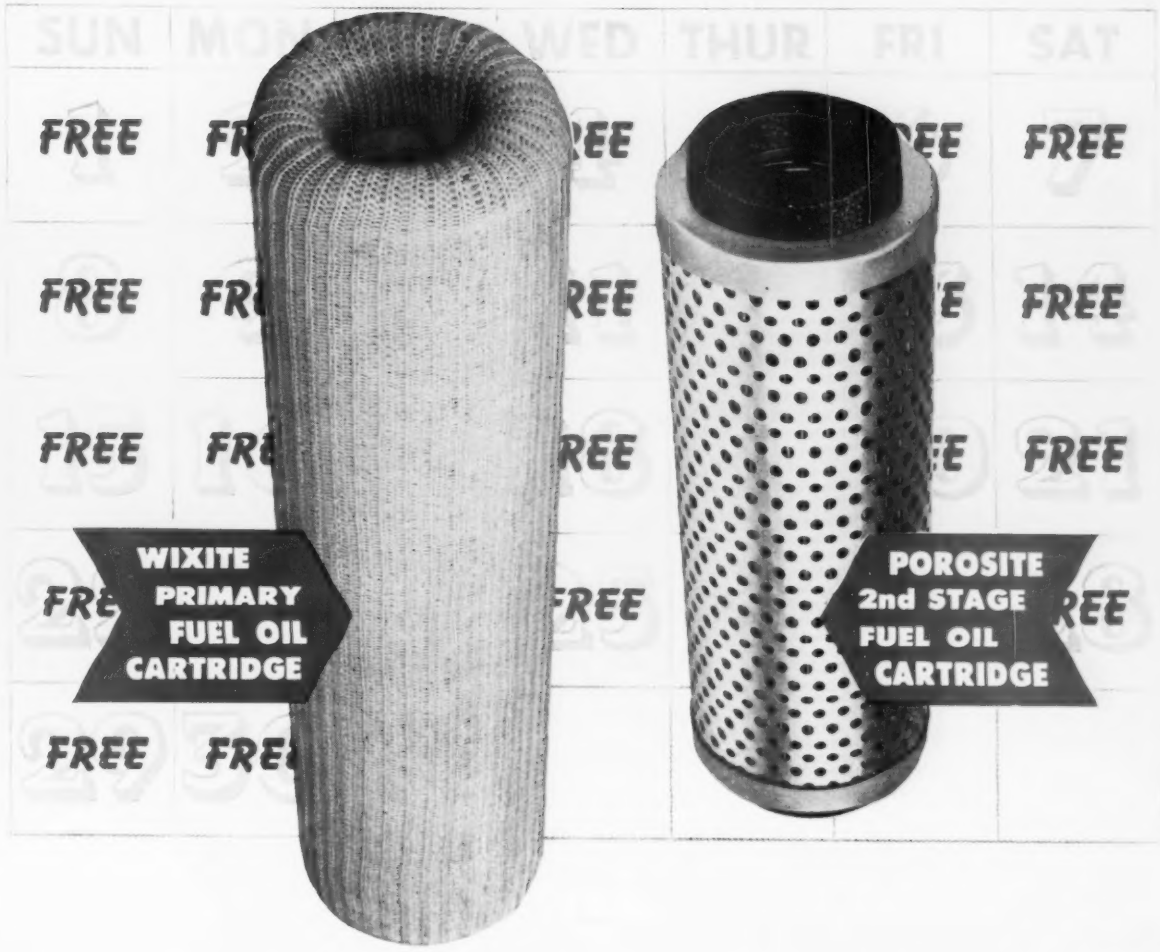
At one stage in the development, consideration was given to the installation of an alternator in a diesel B-unit. The alternator would have been coupled to the locomotive propulsion engine. This proved to be impractical due to weight and space limitations. Then a separate d-c motor-alternator set was considered but again proved uneconomical. It did have one advantage. Almost any locomotive could be used for primary power. A special movement usually produces a spare locomotive which must lay over to be ready to pull the same train later.

Next, it was suggested that a rotary converter could be operated inverted to make a-c out of d-c. Such converters should be cheap, because many have been retired as city railways and small electric railroads were converted to buses or diesels. A search of the literature and discussions with rotary converter manufacturers brought out that such operation was rare but had been done. It was pointed out that such operation tended to be unstable. Lagging power factor increased instability and made necessary further derating because of undue heating in the tap coils. The power factor of a group of cars is poor—about 70 per cent lagging—because practically all of the load is induction motors, either on the cars or on portable battery chargers.

The idea looked interesting and a search began for some second-hand machines. Two 500-kw, 600-volt, d-c machines were located and purchased for a reasonable sum. They were 12 years old, but in excellent condition. There is a fixed relationship between the a-c and d-c voltages in a rotary converter. For these six-phase machines, the ratio is 0.61. To get 3-phase, 240-volt a-c would require a 400-volt d-c input. To get the speed up to 1,200 rpm for 60-cycle output meant working the field current at a low value. This also contributes to instability.

For test, main generator power from a locomotive was fed to one machine running inverted. Its 3-phase output went to the second machine running as a converter with its d-c current being dissipated in a loading resistor bank. By adjustment of fields, any power factor was obtainable and the loading resistor set the load.

(*Continued on Page 48*)



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"Why do you claim only 30 days longer service life for WIX Prescription Filtration of Diesel Fuel?" asks a WIX user. *"Our filters have completed 60 days — the oil's as clean as a whistle and there's no pressure drop."*

WIX claims are on the conservative side. The team of WIX Primary and 2nd Stage Fuel Oil Cartridges provides big savings in filter cost per mile and labor cost servicing filters. But, these savings are only a drop in the bucket compared to what you save with WIX in elimination of Fuel Injection troubles, reduction in Diesel Engine wear and attendant loss in efficiency.

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Locomotive, inverter car, and standing train show how new car has been utilized. First big test for this equipment came last year when IC handled Kentucky Derby trains.

Operation appeared to be quite stable over the calculated operating range and even beyond.

The two machines were installed in an old baggage car—one over each truck. Control board and feeder switches were located at the center of the car. Because each machine is 6-phase, it has two 3-phase circuits with a nameplate rating of 400 amp per phase. This has been further split into 200-amp circuits to match the temporary feeder cable and plug box size. A total of eight 3-phase circuits go out from the car. On one side of the car are receptacles for circuits 11, 13, 21 and 23. Circuits 12, 14, 22 and 24 come out on the other side.

The control is quite simple. Each machine has a small rheostat which, working through an EMD hump control arrangement, controls diesel main generator voltage. The small voltage variation inherent in this hump control caused no trouble and could scarcely be detected by meters.

A four-wire control cable goes to a box which is placed near the governor of the engine. The control cable is unplugged from the governor and plugged into the box and the box cable is plugged into the governor. Three single wires with clips go to certain points in the locomotive control cabinet and are clipped onto terminals. A rotary switch on the control box is used to select engine speed. Each machine also has a field rheostat for controlling frequency. By an arrangement of plugs and receptacles, the safety devices of No. 2 machine are cut into No. 1 control when both machines are operating from one generator.

Each machine has an overspeed switch, inverse time overloads in two phases of each three-phase circuit, and all outlets are fused. No protection is provided in the d-c side, but the main generator has a heavily drooping characteristic and the flip of a control switch or operation of the overspeeds or overloads drops main generator voltage to zero in a few seconds. As the commutator end of the rotary is solidly wired to the locomotive generator, opening the generator field switch causes dynamic braking, feeding power back into the diesel engine and brings the rotary to a stop very quickly and smoothly.

The rotaries can be operated from any EMD locomotive with a PG governor and the hook-up takes about 20 min. Disconnect time is about the same. The idea can be adapted to almost any diesel-electric locomotive but may get somewhat more complicated on some. The EMD GP-9 locomotive matches very well because 300-kw is available in third throttle notch, 430 kw in fourth notch, and 615 kw in fifth notch. The fifth notch under load is a little noisy, but third and fourth notches are acceptable. The engine cannot be heard from inside a car. Engine speed can be changed under load without difficulty.

The idea got its first full scale tryout at last year's Kentucky Derby. There were 28 sleepers parked for occupancy from early Friday morning, May 2, until Saturday evening. Five cars had both Waukesha Enginator and ice engine, and required no outside electric power. Five cars had Pullman mechanical equipment and required power for air conditioning plus battery charging, as did eight cars with electro-mechanical equipment. Ten cars had single Waukesha units and needed power for battery charging.

The 220-volt load averaged 203 kw, and totaled 6,804 kw-hr. This required 720 gal of fuel for a cost of 1.1 cents per hw-hr. The load reached a peak at one time of 370 kva, and operation was quite satisfactory. Both rotaries were operated from one generator and were connected six-phase parallel on the a-c side. This improved stability especially during line starting of the 25-kw Genemotors, but called for careful watch over proper division of reactive current. A minor revision in the field control is expected to make this less exacting in the future. Frequency was held between 56 and 57 cycles to provide for some variation with the overspeed switches set at 67 cycles or 1,340 rpm.

No attempt was made to balance the load between the two main circuits, 1-3-5 and 2-4-6. Apparently, this made no difference to the machines. Circuit 1-3-5 happened to load up first, and then circuit 2-4-6 came on later, and sometimes this load became almost double that on 1-3-5. No attempt was made to control build up of load. Cars were coupled to the standby at random, and this kept two men busy at the controls during the build-up period. The change in controls, mentioned above, is expected to make this a one-man operation. After the load settled down, infrequent minor adjustments were all that were necessary.

The rotaries were paralleled through several hundred feet of cable on the ground and on an overhead pole line which may have introduced sufficient reactance for stability. No tendency to hunt was observed at any time. The reactive current was allowed to get somewhat unbalanced several times without difficulty but there is a critical point beyond which all control is lost.

The machines can also be operated at 440 volts a-c merely by raising the d-c input voltage to 725 volts which automatically doubles the kv capacity. Operation at 440 volts is inherently more stable. Calculated capacity of the car is 500 kva at 70 per cent lagging power factor and 240 volts in two, four or eight 3-phase circuits. At 480 volts, the capacity would be 1,000 kva. The car is available for use on other roads when not needed on the Illinois Central.

Was It Lighting Failure . . . or Crew Failure?

by Gordon Taylor

When the crew boarded the streamliner locomotive, a two-unit Electro-Motive E-8, it was afternoon and there was plenty of daylight. It was not until the sun began to set that it became apparent that there was something wrong with the locomotive lights. First, the engineman noticed that the gage lights were not burning. Checking further, it was found that all the lights on the lead unit were out with the exception of the two classification lights and the Mars headlight.

Some time was lost while the enginemen looked for the cause of their trouble. Nothing they could think of would restore complete lighting service. The crew then decided to continue their run, using the Mars light as a temporary headlight and using flashlights to check gages.

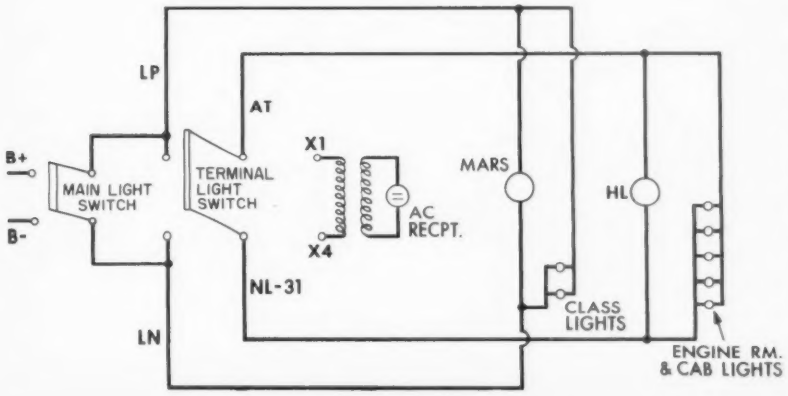
When the train arrived at the next division point, a new crew took charge of the locomotive. They faced the same problem. They were unable to restore complete lighting service and, like the first crew, continued using the Mars signal light as a sort of emergency headlight.

In the meantime, word had been wired ahead reporting the trouble and asking for assistance. Fortunately, at the first station stop, there happened to be another locomotive with a fireman better informed than the men of the first two crews. The fireman climbed into the cab of the streamliner lead unit and threw the Terminal Light Switch to the reverse position. That instantly corrected the trouble, and lights on the unit came on again. This illumination revealed a regular engine crew with very red faces.

It is always better to understand a few things, than to misunderstand many. So it would be well for us to discuss this Terminal Lighting Switch. Many roads have locomotives equipped with them. The purpose is to provide a connection where locomotives can obtain d-c lighting current from diesel shop a-c receptacles. This relieves the locomotive battery of the lighting load while a unit is tied up for repairs. This switch is simply a double-pole, double-throw switch. Thrown one way, the switch connects the lights to the battery for road service. Thrown the other way, the lights are connected to a small transformer which is served by an extension cable plugged into the engine house lighting circuit.

The way the terminal lighting switch is connected to the transformer provides stand-by lighting service to all lights on the locomotive except the Mars signal light and the two classification lamps. When the locomotive is standing in the house for repairs, the Mars light and the class lights are not needed and are not included in the stand-by lighting circuit. The Mars light and class lights can only be lighted through the main light switch that is fed from the battery.

The important thing to remember is that when the locomotive is in service on the road, the engine room lights, the instrument panel lights and the headlight will *not* burn if the Terminal Lighting Switch is in the wrong position. To secure complete lighting service when a locomotive is



Schematic shows connections for locomotive lighting system.

in road service, two things are required. First, the main light switch must be closed to connect all lights to the storage battery. Second, the Terminal Lighting Switch must be thrown in the direction that will connect it with wires LP and LN which are connected with the main light switch.

On E8 locomotives this Terminal Lighting Switch is located on a panel at the rear of the cab, just back of the fireman's seat. Wires leading to this switch are concealed in a steel cabinet, covered by a metal plate which does provide an inspection door for wiring to the Terminal Lighting Switch.

The six wires attached to the switch are X1 and X4 (from transformer terminals), NL31 and AT (attached to the center pair of contacts on the double-throw switch), and LN and LP (Negative Light and Positive Light). LN and LP are the wires that connect with the storage battery. When the Terminal Light Switch blades are thrown in the position which connects wire NL31 to LN, and connects wire AT to LP, all lights on the locomotive can be lighted provided the main light switch is closed to connect the battery.

This case was brought about by the failure of the maintainer to throw the Terminal Lighting Switch to the correct position for road service, after the stand-by lighting cable was removed from the locomotive. The case was further complicated by the crew's failing to understand that when no lights will burn except the Mars signal light and the two class lights, then it is time to check the position of the Terminal Lighting Switch.

This case recalls another one in which all lights failed except the Mars signal light and the class lights. This one was caused by a wire breaking at the Terminal Lighting Switch. In this case, a thorough understanding of the wiring connections enabled an electrician to diagnose the trouble as one involving the Terminal Lighting Switch. When he removed the cover of the switch, he found wire NL-31 broken. He skinned the insulation of the end of wire NL-31 and made a wrapped connection to wire LN. This action completed the circuit with a temporary connection and sent the locomotive on its way with only a few minutes delay. So we'll repeat what was stated earlier: "It is better to understand a few things than to misunderstand many."

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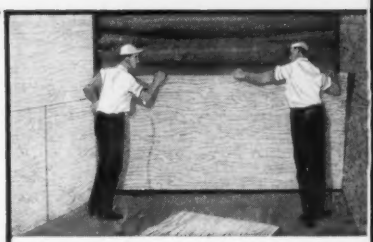

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Labor time averages 8 to 10 hours per car, including preliminary framing, relining, cement coating floor.

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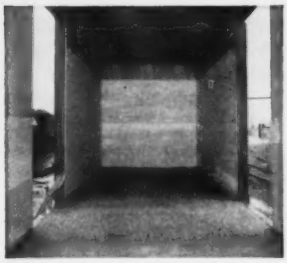

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New method of stapling fir plywood over damaged lumber lining permits Southern Pacific to upgrade B and C cars to Class A carriers in only one-third the time and half the cost.

SOUTHERN PACIFIC has opened the throttle on one of the biggest car modernizing programs in its history. Work on over 400 cars is proceeding at a good clip and at remarkably low cost at the line's big West Oakland and Roseville (California) yards.

Credit for the outstanding speed and economy with which the job is being done is credited to a new technique; stapling big sheets of Exterior plywood over the old lumber lining.

The method takes only about one-third the time normally required for re-lining a car with T&G lumber—and cuts total costs just about in half. A big factor in the savings is that the old lining does not have to be torn out, as would have been the case in a lumber re-lining job.

The job is done by a two-man crew who tack panels in place horizontally so that two 4-foot wide sheets make up the required eight foot height. Since most cars are a bit over 17 feet from door frame to end, one 8-foot and one 10-foot long panel cover each course. Vertical joints are staggered. Then two more men follow up for finish stapling, shooting fastenings every six inches around panel edges and over vertical posts spaced 20 inches apart.

One of the chief advantages of the plywood-stapling method is that cars are out of service for a very short time. Beyond that, it's the best and most economical way of doing the job. But the payoff is in the more valuable ladings which can be carried in a Class A car, and it is often enough to pay off the entire upgrading cost in a single long run.

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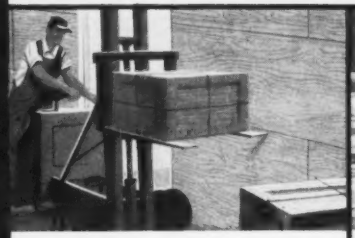

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11 Roll Them Out Like New

Armature Cores and Shafts

THE ARMATURE CORE assembly with its shaft, laminations, retaining heads, and commutator is the mechanical structure into which the armature windings are nested. The shaft is the backbone, and must be strong and straight. It carries the magnetic core which is made up of the hundreds of thin sheets of steel, the laminations. While they are fragile in themselves, they add strength and stiffness to the complete assembly when clamped between cylindrical heads.

Because of this construction, the various components of the armature core assembly can be replaced when they are damaed. A good opporutnity to look for signs of damage is when an armature is stripped. The core assembly may then be thoroughly examined and any damaged parts, such as the shaft or laminations, can be repaired or replaced. Major commutator repairs will be discussed in Part 12.

Care should be exercised in handling the armature core. If it is rolled or dragged over a rough floor, the laminations may be bent. The commutator is also easily damaged by other types of bumps or blows. In handling these vulnerable parts, be sure to observe the precautions given in Parts 3 and 12 of this series.

Pedestals are usually required to support the core for inspection or work. They should hold the core at about waist height and permit it to be rotated easily. Cores should be stored where they will not be bumped or rolled over rough surfaces. Platforms or racks with soft metal or wood surfaces are good for this purpose. Observe the same precautions for upending the core assemblies that have already been recommended for handling wound armatures.

This is the eleventh article in the series covering heavy maintenance of locomotive electrical equipment.

Part 11 is written by W. F. Davis, Locomotive and Car Equipment Department, General Electric Company, Erie, Pa.

Fig. 1—Example of severely damaged armature core that will require complete rebuilding before it again can be used.

Removing the Shaft

If a core has suffered extensive damage, such as shown in Fig. 1, the complete set of laminations must be replaced and the commutator refilled. Both the commutator and core stack must come off the shaft. This requires a powerful press and the proper adaptors. Various makes of armatures require different procedures. If you are not sure, refer to the manufacturer's instructions and carefully study the section drawings to determine what to do first. Check the different fits involved before applying pressure. Armatures with cores stacked on quills may take less pressure than those having the laminations "hot pressed" directly on the shaft. Hence, the tonnage required to press the shaft out may vary considerably with different machines. Usually a 200 to 250-ton press will be large enough, although a few cases may require up to 500 tons.

After the bearing collars and spacers have been removed (Part 8) the core assembly should be set up in the press so that the pressure is applied to the shaft at the commutator end and to the pinion-end head or quill. When working on traction motors, a section of heavy-walled pipe, approximately 6-in. inside diameter and 30 in. long, comes in handy. When this is placed on the pinion end of the core, the shaft can be completely removed by pressing it out of the core and into the pipe.

If a horizontal press is used, suitable arrangement must be made to support the weight of the commutator and core. The exact pressure points vary with the construc-

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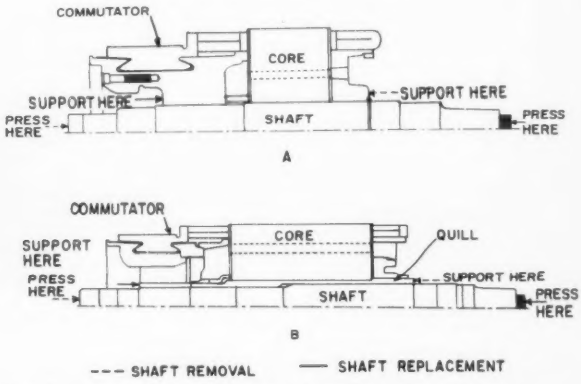
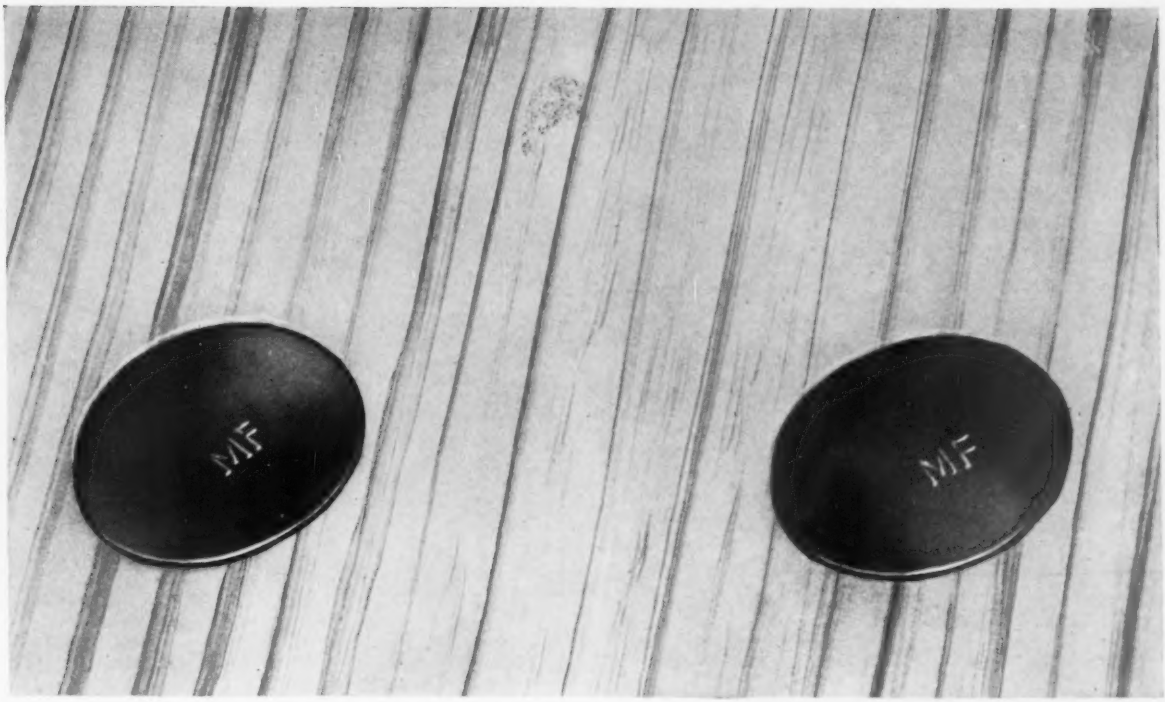


Fig. 2—Sections through two types of traction motor armatures, showing shaft removal and replacement in a wound armature.



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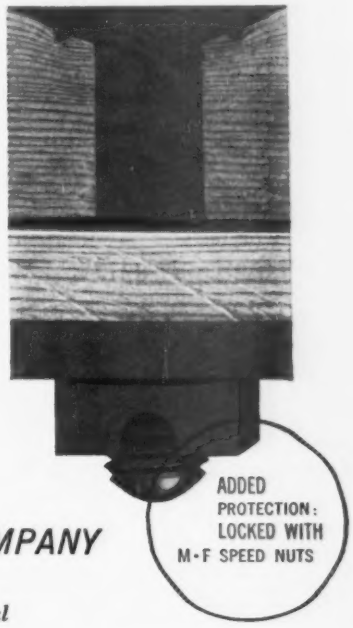

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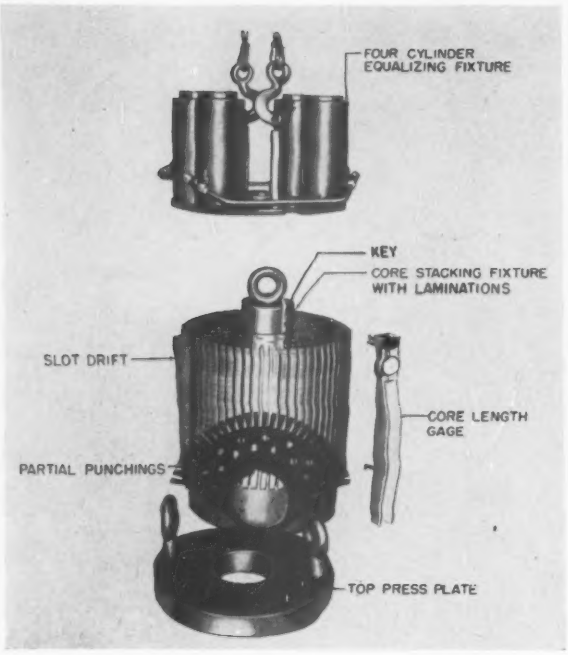

Fig. 3—Core stacking fixture with laminations and tools.

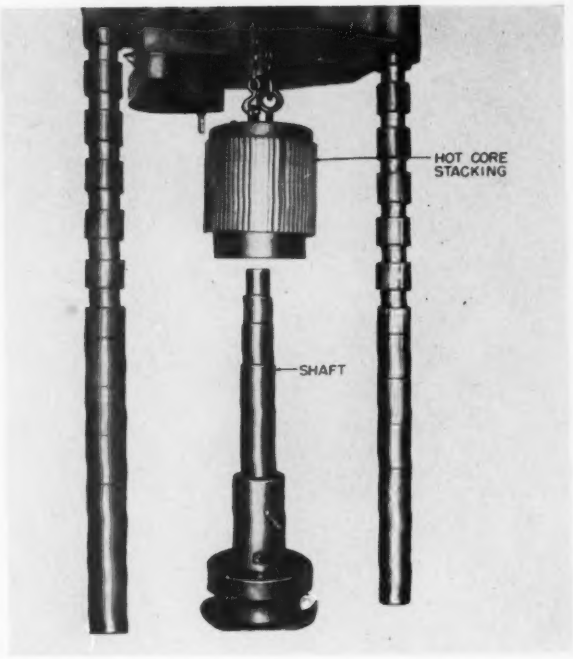

Fig. 4—One method of placing hot core stack on shaft.

tion of the core. Figure 2 shows them for two common types of traction motors. If over 250 tons pressure is used, the metal on the end of the shaft may be upset. If the shaft is to be used again this should be avoided. One way is to heat the core to about the temperature for baking varnish (150 deg. C). This may loosen it enough to permit the shaft to be pressed out. Otherwise the job will have to be done on a larger press.

Core Rebuilding

When a complete core is to be "hot pressed" on a shaft without a keyway, special fixtures, such as shown in Fig. 3, must be used. The punchings are first stacked on the core stacking fixture, using approximately the right number of end and main punchings. A key on the dummy shaft aligns the punchings. Then the assembly is pressed under specified tonnage, using the equalizing fixture to distribute the pressure. The core height should be adjusted within the limits allowed by manufacturer's instructions.

If the side-to-side variation is less than half the thickness of a thin punching, the core stack need be adjusted for height only. If the variation is greater, say $\frac{1}{32}$-inch, it should be corrected by using a half punching (See Fig. 3). Generally height can be adjusted within the thickness of a thin punching, and accuracy of squareness within a half punching. Sometimes two partial punchings may be used to correct a stack, but it is not advisable to use three. If the stack is that far off, it should be rebuilt using a different combination of punchings. Another way is to turn some of the punchings over when restacking.

When the stack meets specified limits, it is bolted together using long bolts. These pass through the heavy top plate, the full stack of punchings and the armature head, and are threaded into nuts previously placed at the bottom of the core stacking fixture. The bolts are set up as tight as possible, and the whole assembly removed from the stacking fixture. A couple of drifts driven into the core slots will maintain alignment of the stack. The shaft should be brushed with a mixture of graphite and oil to permit future disassembly without galling. The core is then pressed on. One method is shown in Fig. 4. Specified tonnage should be held for 10 min to allow the core to set on the shaft.

If only a short section of the core is damaged, a complete rebuilding job may be unnecessary. For instance, if a section near the commutator end is burned, the damaged laminations may be replaced without removing the core from the shaft. In this case, the damaged punchings should be removed by hand, one at a time. New punchings should also be added one at a time, using outside drifts in the slots for alignment.

If the damage is at the pinion end, the shaft must be pressed out and the core completely restacked, using new punchings in place of the damaged ones. A core that has been in service is generally pretty well stuck together, so it may be possible to handle it as a unit without using the fixture. Individual shop practice, based on experience, is the best guide to whether or not the fixture is required.

Assembling the Commutator

After the assembled core and shaft have cooled to room temperature, the commutator may be pressed on. When the shaft has no keyway, special fixtures, such as shown in Fig. 5, must be used to properly align the commutator and core.

The split twisting collar and line-up fixture (Fig. 5) are placed on the commutator. The proper angular position for the fixture is obtained by adjusting it so that the four 90-degree-spaced marks line up with the centers of their respective mica segments on the commutator.

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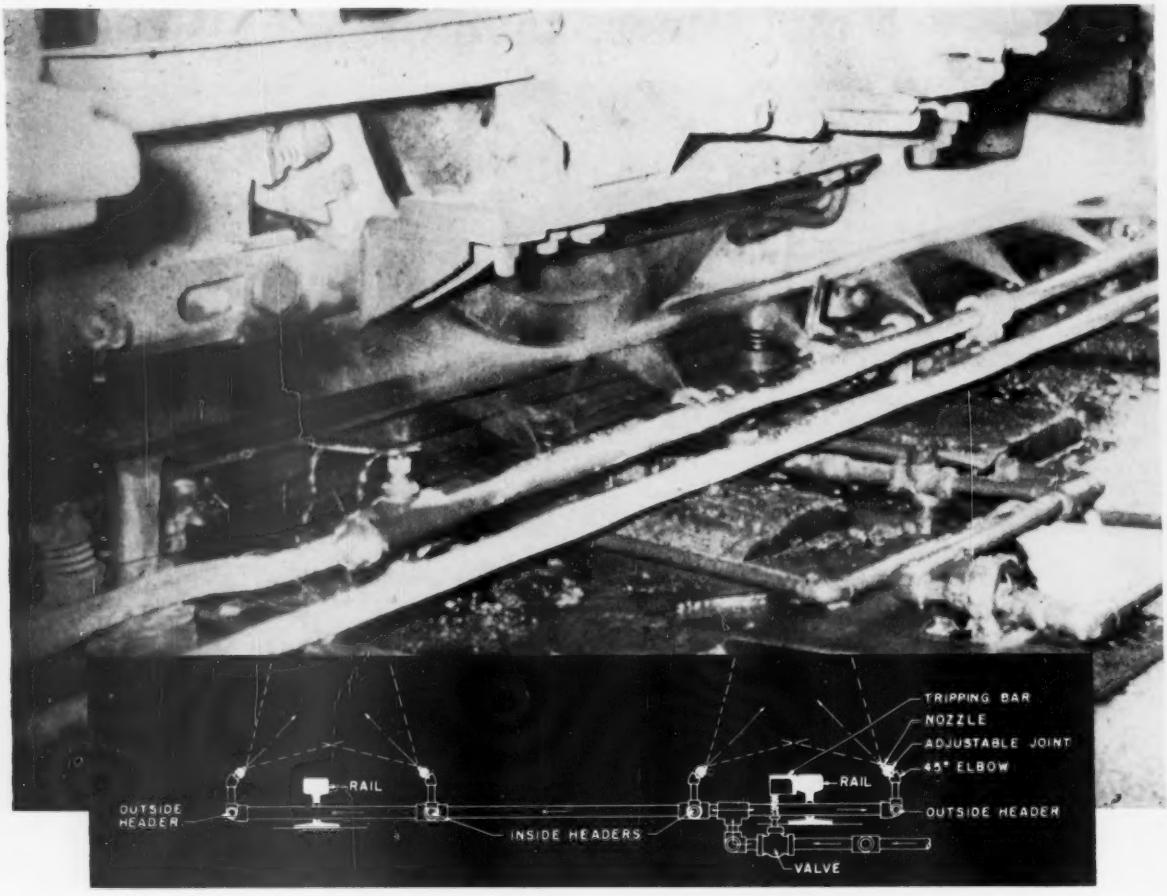

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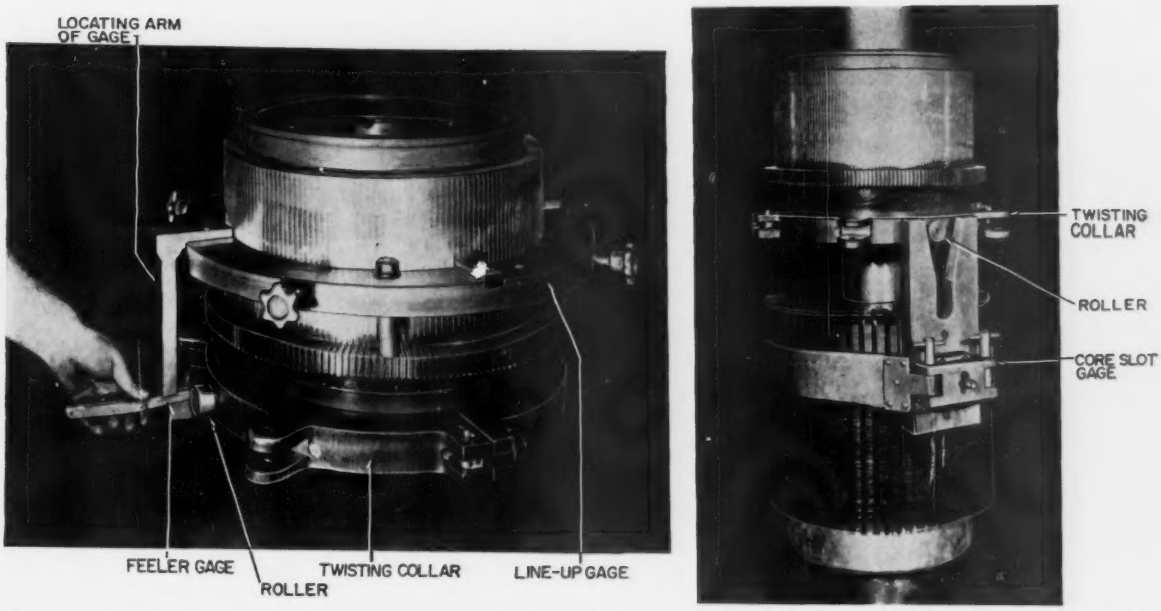

Fig. 5—These fixtures are used for assembling the commutator with its shaft and core. The commutator lining-up fixture and twisting collar (left) are applied initially, and the core slot gage (right) assures alignment as the assembly is pressed into position.

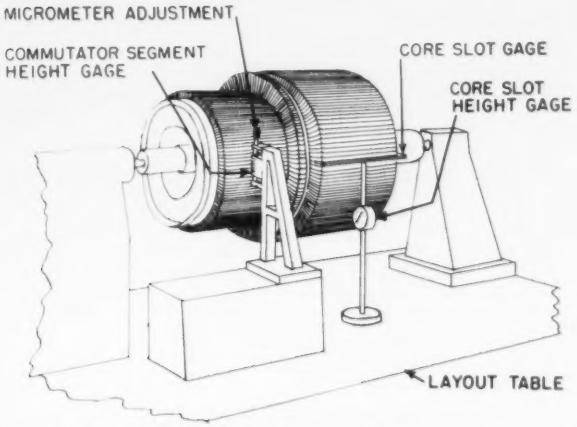

Fig. 6—One method of checking alignment of commutator and core.

The four hand screws are then tightened and the line-up rechecked. The twisting collar is rotated until the roller is spaced correctly from the gage block on the line-up fixture, as indicated by the feeler gage. It is then tightened with a wrench. After this the line-up fixture is removed, leaving the twisting collar tightly clamped in place.

The commutator is heated to approximately 120 deg C. After the shaft fit has been brushed with a mixture of graphite and oil, the commutator is carefully lowered into place. As it is slowly pressed down the roller on the twisting collar engages with the V-slot in the core slot gage, rotating the commutator to proper alignment (See Fig. 5). After the commutator has seated against the laminations, specified pressure should be held for about 10 minutes to allow it to set on the shaft.

If only the commutator is to be removed, it may be pulled by means of a press or hydraulic puller. Generally four bolts are screwed into the tapped holes from which commutator bolts have been temporarily removed. The exact arrangement varies with different machines. Refer to manufacturer's instructions regarding the number of bolts to be used, and the proper pressure. This will usually be 50 to 60 tons, and seldom over 100 tons.

Checking the Completed Core

Exact alignment of the commutator and core is necessary to insure proper operation when the machine is rebuilt. Therefore it should be checked before going further. If there is enough rebuild work, a device such as shown in Fig. 6 will pay for itself in time saved. The armature core is supported in centers and accurate measurements are taken from the layout table to the center of the core slot, using a suitable slot gage. Actually, the armature is rotated to line up the slot center to the height gage. With the armature in this position, another height gage is used to measure the center of the commutator mica. If these measurements do not agree within the limit recommended by the manufacturer, the commutator should be pulled and realigned.

Shaft runouts can be checked in the same setup, using a dial indicator to read the eccentricity of the main bearing fits. Usually this reading should come within 0.001 inch (total indicator runout). If this, or any other working limit is exceeded, the shaft should be straightened. This can be done in a press, using hardwood blocks under the shaft extensions to support the armature core. Pressure is applied through a hardened steel drift placed in the slot on top of the core. A steel spacer block, slotted for the drift, is used. Where there is a volume of work, a special fixture for supporting the core in the press may be justified.

The core assembly is truly the foundation for building the completely wound armature. If it is square, true and strong the rebuild job will have a good start. No amount of care in later stages can make up for sloppiness or indifference here. The alert shop man realizes this, and makes sure he has the best possible foundation.

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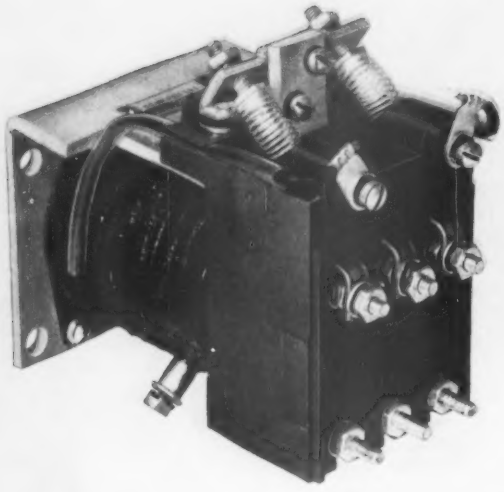

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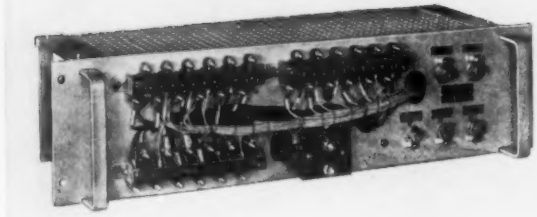

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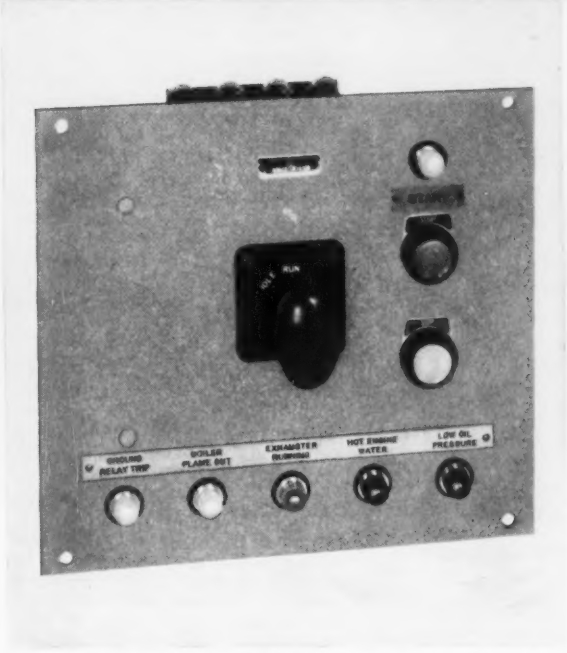
UP-GRADE YOUR G-E EQUIPPED ROAD LOCOMOTIVE during its next overhaul by installing this Simplified Amplidyne Control Modernization Kit. For more information, contact your locomotive builder directly. General Electric Company, Locomotive and Car Equipment Department, Erie, Pennsylvania. 128-65

KIT CONTAINS IMPROVED COMPONENTS FOR EASIER INSTALLATION



COMPACT ENGINE-START PANEL simplifies start-up procedure. Starting switch is of push-button type, while engine control switch has only two positions to operate.

MAIN CONTROL COMPARTMENT shows new wiring and Simplified Amplidyne Control equipment in place. Note compact arrangement and accessibility of components.

that make up General Electric's Simplified Amplidyne Control Modernization Kit.

Progress Is Our Most Important Product

GENERAL ELECTRIC

Supply Trade Notes

(*Continued from page 12*)

pany of Toledo, Ohio. *R. H. Barnard*, president of L. O. F., elected president of this research, development and production division. Division general offices, 1810 Madison avenue, Toledo.

■

SHERWIN-WILLIAMS COMPANY OF CANADA, LTD.—*E. Colin Baldwin*, executive vice-president, elected president, succeeding *Douglas A. Whittaker*, retired. Mr. Baldwin also managing director.

■

UNITED STATES STEEL CORPORATION, NATIONAL TUBE DIVISION.—*Louis W. Mason* appointed sales manager, eastern area, with headquarters in New York, succeeding *Andrew P. Happer*, deceased. *James G. Morrison*, manager of sales, Detroit, succeeds Mr. Mason as sales manager, central area, at Chicago.

■

SPERRY PRODUCTS, INC.—*Frank U. Hayes* named president and general manager. Mr. Hayes formerly vice-president and assistant general manager of the Bullard Company, Bridgeport, Conn.

■

DUFF-NORTON COMPANY.—*Lucian J. Courtney, Jr.*, appointed manager-sales service, Coffing Hoist Division, Danville, Ill., succeeding *A. M. Kelly*, now district sales manager in San Francisco.

■

A. M. BYERS COMPANY.—Following named distributors of Byers new 4-D wrought-iron pipe: *Ohio Pipe & Supply Co., 14615 Lorraine avenue, Cleveland; Springer & Schmalz Supply, Inc.*, Utica, N.Y., and *Traverse City Iron Works*, Traverse City, Mich.

John H. Ingalls appointed field service engineer, Boston Division.

■

AIR REDUCTION SALES COMPANY, DIVISION OF AIR REDUCTION COMPANY.—*R. E. Lenhard*, executive vice-president, appointed president, and *Dr. Albert Muller*, assistant to the president, appointed vice-president.

Charles I. MacGuffie appointed manager of Special Products Department, an expansion of Air Reduction's Machine Welding Department, through which selected products requiring specialized engineering assistance in their application will be made available for industrial use as they are developed in the research laboratory.

ARCRODS CORPORATION.—Dr. Gerard E. Claussen appointed director of research and welding for Acrods, a wholly-owned subsidiary of Air Reduction.

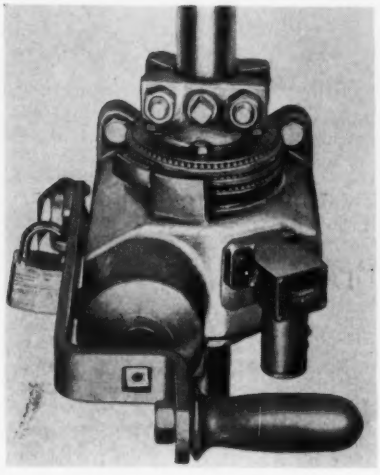
■

NATIONAL MALLEABLE & STEEL CASTINGS CO.—*Carlisle R. Slater*, general superintendent, appointed manager of Melrose Park (Ill.) Works.

Obituary

L. L. NEEBE, 66 retired chief engineer, Magnus Metal Corporation, subsidiary of National Lead Company, died January 18 at his home in Ft. Lauderdale, Fla.

WHAT'S NEW—(Continued from page 15)

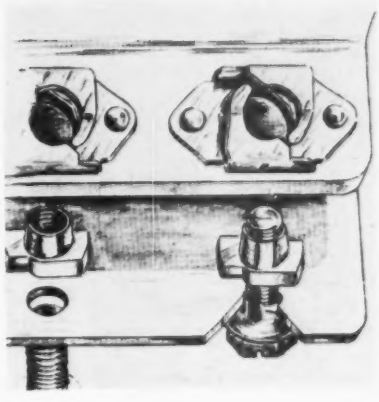


Gear Box for Power Switches

A gear box for torsional operating mechanisms of power switches has a shaft opening for 1½-in. IPS pipe, and available gear ratios are 20.5:1 and 40:1. It is applicable to vertical operating shafts of group-operated switches and can be mounted without cutting or drilling the operating shaft. The box is doubly keyed to the operating shaft with a bolted clamp and two self-piercing set screws. The removable handle stores compactly and locks the handle shaft in a fixed position. A "keeper" prevents accidental dislodgement of handle during switch operation.

Open and closed stops of the gear box are adjustable through 360 deg. For clockwise rotation of the handle, the gear box is available either for clockwise or counterclockwise rotation of the operating shaft.

Provision is made for direct mounting of a keyed interlock, an optional accessory which may be used to make a switch inoperable either in open or closed position, or both in open and closed positions. *Line Material Industries, McGraw-Edison Company, Milwaukee 1, Wis.*



Quick-Release Panel Nut

The Type FR quick-release panel fastener is a nut and basket retainer for use on doors and removable panels of cars. It is said to be simple to install and virtually foolproof in operation, having no springs or pins to break or distort.

In operation, as the bolt is rotated, the self-locking nut turns from the entry slot of the gasket and lifts on the beveled edge of the nut lugs into the basket recess. The lifting action of the nut draws up the screw and attached cover plate into firm, positive contact with the base plate at the desired preset loading.

A self-locking Elastic Stop nut is used as the latch-lock element in the basket retainer. Only a quarter turn of the bolt is needed to complete the lock-unlock action.

The new fastener is available in the ¼-20 thread size. It is also designed in the ¼-28 thread for future requirements. For applications requiring spring ejection of the screw head, an auxiliary Type FRF, spring, can be provided. Ejection of the screw head becomes a warning device to

indicate unlocked fasteners in large panel areas. *Elastic Stop Nut Corporation of America, Dept. RLC, 2330 Vauxhall road, Union, N. J.*

Grain Door

The Shamrock grain door is designed for barricading box car doorways 7, 8, and 9 ft wide and is available in heights from 18 in. to 120 in. It is constructed of high-tensile reinforced fiber-glass paper backed by hard wood horizontal beams having 2-in. by 3-in. sections with 18-in. bevels, making the 3-in. section ⅛ in. thick at each end. At the ends are pre-drilled nail holes. The paper has reinforcing in all directions, with triple strength bands added at all pressure points. Both the beams and paper extend 12 in. beyond each door post, thus utilizing the pressure of the lading to make a leak-proof seal.

A vertical brace post and cross wires barricade 8- and 9-ft wide doorways to prevent excess bulging due to sharp impacts or extra high loads. The barricade is said to be adaptable for mechanical car loaders. The grain doors are weatherproof and each unit, including nails, is packaged as a complete car set. *George T. Murphy Co, Dept. RLC, 1539 Morrow ave., North Chicago, Ill.*

Waterless Hand-Cleaner Dispenser

The D-1000 waterless hand-cleaner dispenser is loaded by removing the cover and dispenser disc from the regular 5-lb can of K&W soap and pushing it down over the spring-loaded diaphragm until it locks into position on the dispenser base. A normal quantity of soap is automatically cut off and deposited in the hand with each push of the handle. The dispensing mechanism does not lose it's prime until can is completely empty. An empty can is removed by tripping the two locking devices on either side and raising the can straight up. This operation and reloading takes about 3 sec. *K & W Products, Inc., Dept. RLC, P.O. Box 231, Whittier, Cal.*

HELPS FROM MANUFACTURERS

The following compilation of literature—including pamphlets and data sheets— is offered free to railroad men by suppliers to the railroad industry. To receive the desired information write direct to the manufacturer.

FREIGHT CARS. 16-page brochure describes the Chicago Freight Car company's new Chicago shops and its car-building facilities. Illustrates also new, rebuilt and reconditioned passenger and freight cars for lease or sale. (Write: *Chicago Freight Car & Parts Co.*, Dept. RLC, 228 N. LaSalle st., Chicago 1.)

WELDIRECTORY OF MANUAL ELECTRODES. 20-page Bulletin 7000.2 a procedure guide for Lincoln manual arc-welding electrodes for hardsurfacing and for welding stainless steels, non-ferrous metals and cast iron. Describes each electrode, its properties and applications, and how to use it. (Write: *Lincoln Electric Company*, Dept. RLC, Cleveland 17.)

BORING MACHINES. Construction details, specifications, and floor plans included in booklet describing largest standard horizontal precision boring machines in Ex-Cell-O line. (Write: *Ex-Cell-O Corporation*, Dept. RLC, 1200 Oakman Blvd., Detroit 32.)

CENTER BONDED MOUNTINGS. 4-page Bulletin No. 712 describes vibration isolation and heavy shock absorption features of center bonded mountings for flexible suspension systems in mobile, transport-mounted or portable equipment. (Write: *Lord Manufacturing Company*, Dept. RLC, Erie, Pa.)

ADHESIVES, COATINGS, SEALERS. 12-page catalog describes design concepts, typical applications, and general characteristics of adhesives, coatings and sealers. (Write: *Adhesives, Coatings & Sealers Division, Minnesota Mining & Mfg. Co.*, Dept. RLC, 900 Bush ave., St. Paul 6, Minn.)

WELDING FILM. 8-min sound and color 16 mm motion picture, "Introduction to Manual Heliarc Welding," orients beginner in Heliarc welding—how it works and what it can do. Shows basic pieces of equipment and their relationship to each other, how to make a simple weld, and results to be expected. Available without charge. (Write: *Linde Company, Division of Union Carbide Corporation*, Dept. RLC, 420 Lexington ave., New York 17.)

GAS REGULATORS. 36-page Form ADC 705F covers Airco line of cylinder, manifold and station pressure regulators. Contains flow and pressure specifications, and inlet and outlet connection dimensions for each regulator. (Write: *Air Reduction Sales Company, a division of Air Reduction Company*, Dept. RLC, 150 East 42nd st., New York 17.)

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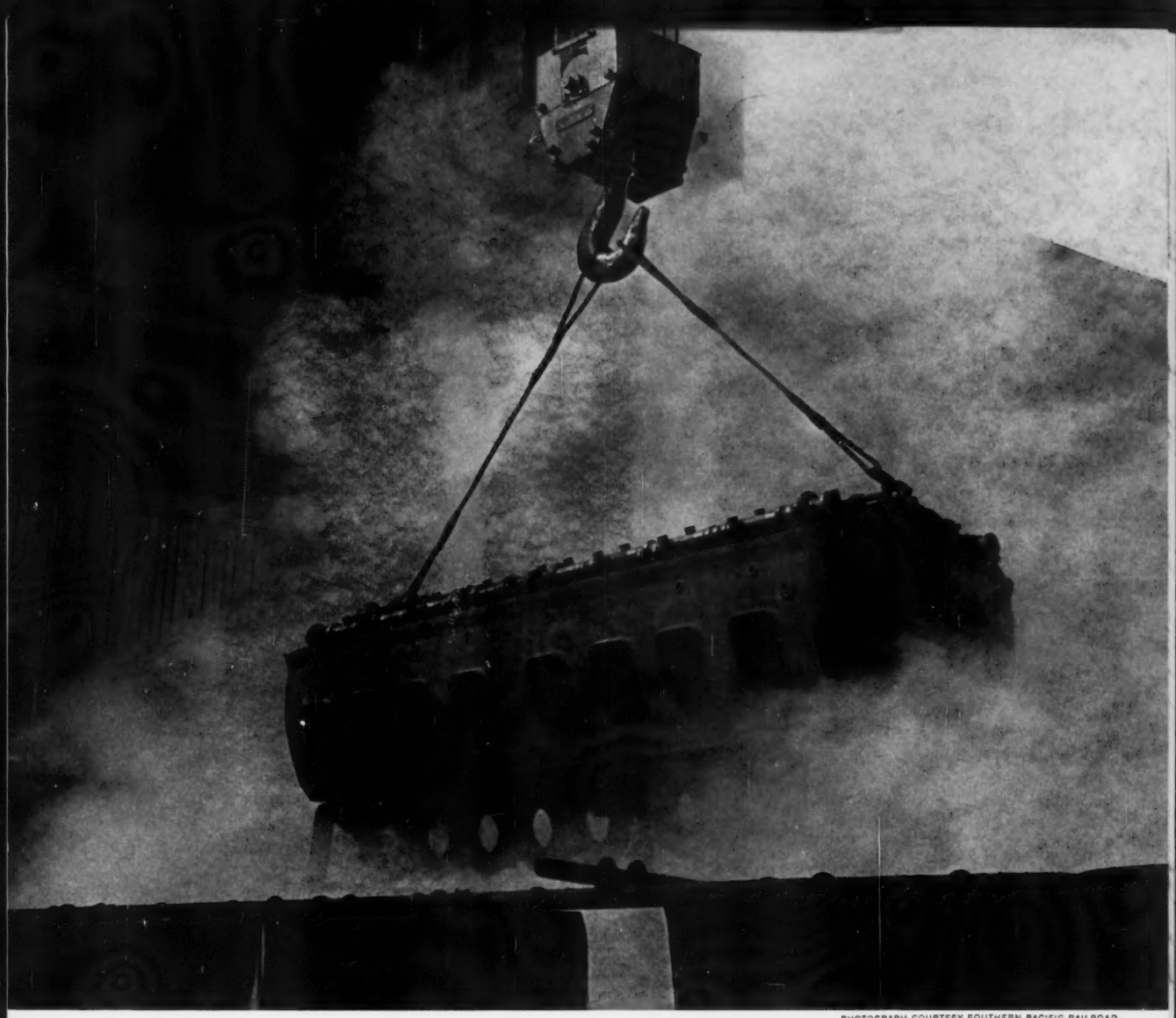

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When the problem is the stripping of heavy deposits from diesel "A" frames and other parts, diesel operators the nation over have, for years, relied on Turco Ferrex B. The standard and accepted hot tank material for the cleaning of steel diesel parts, Ferrex B *quickly* and *thoroughly* removes the most stubborn soils...performs at peak efficiency over a remarkably long tank life...yet is used at concentrations lower than required by most hot tank cleaning compounds (only four to six ounces per gallon)!

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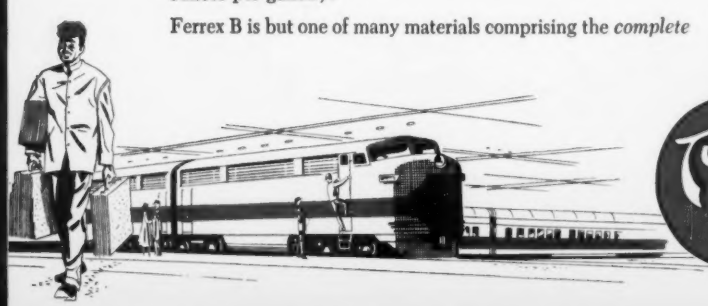

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